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ILLUSTRATIONS

OF

SOUTH AMERICAN PLANTS.

BY

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PREFACE.

The reprint given in this Second Volume of the text originally published in the 'Annals of Natural History,' at different intervals between Feb. 1849 and March 1855, ought to have appeared long ago. Some apology is therefore due for this great delay, which has been owing entirely to the difficulty of preparing the plates. In nearly every instance, failure has resulted where artists have been employed to copy my drawings, and at length I have been compelled to execute these a second time upon stone, and also to complete the remainder, which has occupied much of my time: the only successful aid has been from Miss Wing, who has copied some of my drawings with sufficient accuracy; these are confined to the explanations of the genus *Lycium*, and a few others in outline. Most of the illustrations are lithographed by me on stone; others I have made on paper, which have been copied, as fac-similes, by the Anastatic process. I claim therefore some indulgence, both for the delay, and for the many imperfections in the execution of the plates.

The generic characters, in every case, have been worked out from my own observations, without reference to those of former authors; most of the genera of the *Atropaceæ* have thus been investigated, and nearly all those of the *Solanaceæ*, except the larger groups of *Solanum*, *Capsicum*, *Lithopersicum*, and a few other well-known genera. This has required much patient examination, but the quantity of novel matter hence resulting, relative to the history of these Orders, is considerable, and must be received as a contribution towards future and more complete monographs of these two large families. I have given at some length, my views of the

close relationship existing between the *Scrophulariaceæ*, *Atropaceæ* and *Solanaceæ*, and the lines of demarcation subsisting between them; I have also endeavoured to trace the limits of the several genera in the two last-mentioned families, and to show, at the same time, their differential characters, adding my own opinions concerning their proper systematic distribution. These arrangements are given in the Appendix to the First Volume, together with the considerations upon which the several divisions are founded, and the general Index has, in some measure, been made to serve as a ready key to those references. The reasons that induced me to present the examinations of the several genera in the unmethodical disposition in which they appear in the body of the work, are also explained. In order to elucidate and support my conclusions, I have given floral analyses in all cases where I could obtain them, and plates are sometimes given of well-known genera, to show the data upon which I hold to be distinct, many groups that appear to me to have been associated together upon insufficient grounds, in the elaborate Monograph of the *Solanaceæ* in DeCandolle's admirable 'Prodromus': it will be seen in this last-mentioned work that in many cases my views have been followed, while in others they have been quite unnoticed or not adopted: in the end of the Appendix to this Second Volume, I have discussed the grounds of these differences, and have adduced fresh reasons for the support of my conclusions.

It was my intention, in the first instance, to have confined myself wholly to the consideration of South American plants, but in order to explain the affinities and differential characters of many of these genera, I found it indispensable to institute a comparison between them, and others of the Old World; with a view, therefore, to preserve some degree of consistency, the examination of the latter genera has been placed in the Appendix to the Second Volume.

Hammersmith,
Nov. 1857.

ILLUSTRATIONS

OF

SOUTH AMERICAN PLANTS.

Witheringia.

The following observations will I hope serve to throw some light upon this hitherto obscure genus. It always appeared to me that the *Witheringia picta*, as figured by Martius (Nov. Gen. tab. 227), must either form the type of a very distinct group, or be considered as a very good illustration of that genus, for which reason I refrained from publishing what I had long ago observed on the subject, until I could satisfy myself of the absolute character obscurely indicated by L'Heritier, in regard to his typical species *W. solanacea* (Sert. Angl. 33. tab. 1). Under this uncertainty (in a note, *huj. op.* vol. i. p. 33) I alluded to the unsuccessful search I had everywhere made for some specimen, or better details, of the plant in question, so as to be able to comprehend the limits and features of the generic character of *Witheringia*, and I expressed my regret that the original type no longer existed in L'Heritier's herbarium in the British Museum, as that would at once have cleared up this ambiguity. Dr. Sendtner has since come to a more decided conclusion, by proposing Martius's plant before alluded to as the type of a new genus, which he calls *Athenæa*; but I am not aware upon what grounds he holds it distinct from *Witheringia*, nor can I learn that he has given any determined limits of this latter genus. From observations lately made, it appears to me that farther

uncertainty on this point need not be entertained, and I propose therefore, to offer my reasons, founded on the facts now demonstrated, for justifying the conclusions thus formed. In Sir Wm. Hooker's most valuable herbarium there exists among Goudot's collection from Columbia, a plant which appeared to me to be a *Saracha*, except that its habit is rather more suffruticose and erect than most species of that genus, and its flowers smaller and fewer than usual: on examining this more attentively and comparing it carefully with the figure and description of L'Heritier's plant, I could not do otherwise than conclude that it was very closely related to his *Witheringia solanacea*, and as such may well serve, in the absence of the original, as a substitute for the type of what he intended as that genus. I have also compared this Columbian plant with the descriptions given by Prof. Kunth of several fruticose species, which he arranged in the same genus, and at the same time have examined several analogous plants from intertropical America, either closely allied or nearly identical with these last-mentioned species; and finally, I have compared these with the *Witheringia hirsuta*, Gardn., a species that does not seem to differ from the *W. picta*, Mart., collating this at the same time with Von Martius's excellent description and figure of this latter species before quoted: all these forms exhibit a gradation from *Saracha* on the one hand to *Acnistus* on the other. But *Witheringia*, according to modern authors, is made to embrace a number of heterogeneous species, and it is obvious that, without taking into account L'Heritier's plant, all the remaining species in the herbaceous section enumerated by Dr. Walpers (Repert. iv. 29) do not belong to that genus, being mostly referable to a very distinct section of *Solanum*, probably a good subgenus.

Throughout the vegetable kingdom we find individuals possessing aberrant characters, and exhibiting an intermediate state between the artificial limits of our botanical distributions, or partaking of their mutual extremes, and this is as fully apparent in the *Solanaceæ* as in any other family. Thus, many experienced botanists have found it difficult to determine whether certain individuals should be referred to *Petunia* or *Salpiglossis*, plants not only belonging to separate genera, but hitherto placed in distinct natural orders. In like manner it may be doubted whether certain plants should be referred to *Physalis*, when they are seen to be scanty of the very remarkable character that distinguishes most of its species, viz. the remarkable growth and extreme inflation of the calyx in fruit; and so also in the approximate genus *Saracha*, individuals are sometimes observed, where, combined with a calyx not sensibly increasing in size, they present a corolla deeply campanulate, marked with large coloured spots,

and a pentangular border so characteristic of *Physalis*: in these equivocal points of structure, it appears to me we may call in the aid of their general habit in order to determine the genus to which they should be referred, for in *Physalis* the inflorescence will be found to be universally 1-flowered in each axil, while in *Saracha* it is as uniformly more or less distinctly umbellate. Thus likewise in *Acnistus*, a genus with Cestrum-like flowers, we have a very variable length of the tube of the corolla, which in *A. umbellatus* is hardly distinguishable from the section *Chænesthes* of *Iochroma*; while in *A. arborescens* (the original *Cestrum cauliflorum* of Jacquin, Hort. Schœnb. tab. 325) the tube is so short as to leave no possible distinction between this genus and that called *Witheringia* by Kunth, as will be hereafter demonstrated.

Now, as will be hereafter shown, neither *Witheringia solanacea*, nor the Columbian plant here alluded to as being so closely allied to it, can be distinguished from *Saracha*; they have both a 5-partite calyx, a rotate corolla deeply cleft, stamens arising from triangular expansions originating at the base of its short tube, and the fruit is a pisiform berry supported on a calyx that does not materially increase in size; the peduncle is bifurcate, and forms a 2-flowered umbel as in many species of *Saracha*; and to make this analogy still more complete, although the stem is somewhat lignescent and perennial at base as in some species of this last-mentioned genus, their branches are in like manner herbaceous, and L'Heritier describes *Witheringia solanacea* as possessing the same kind of large tuberose root as in the *Saracha jaltomata*, Schlect.: for all which reasons I have no hesitation in referring all these plants to one genus.

Of the fruticose species hitherto included in *Witheringia*, there are evidently two distinct groups, the several Columbian species enumerated by Kunth, and the Brazilian species of Martius: the former are distinguished by having extra-axillary fascicles, generally of numerous, sometimes of very few flowers, always upon simple peduncles, and not umbellate as in *Hebecladus*; the calyx is always distinctly tubular, with an almost entire margin, and five very minute distant teeth, not 5-partite as observed in *Hebecladus*, *Saracha*, and *Witheringia picta*; the corolla is tubular, with a 5-partite border, not so decidedly long and infundibuliform as in *Hebecladus* and *Acnistus*; the berry is small, seldom exceeding the size of a peppercorn, and is supported on a small persistent and nonaugescent calyx; it is not one-tenth the size of the large oval berry inclosed within its increasing calyx, which is seen in *Witheringia picta*; the positive characters here alluded to will be found to approach very closely to *Acnistus*, and to be quite incompatible with the plants of the other group referred to.

From these several facts the inference is irresistible, that *Witheringia solanacea* should at once be referred to *Saracha*, and that *Witheringia macrophylla*, *W. ciliata*, *W. mollis*, *W. rhomboidea*, *W. dumetorum* and *W. riparia* of Prof. Kunth, together with some others, form a distinct group, which I propose to call *Brachistus*, and that the genus *Witheringia* as defined by L'Heritier must fall upon that group of plants, of which the *Witheringia picta*, Mart., may be considered the type. These are distinguished by an inflorescence either solitary or fasciculate in each axil or dichotomy of the branches, in which latter cases they arise successively at different periods, so that we see in each fascicle, every gradation of development from the nascent bud to the ripened fruit: the peduncle is always 1-flowered, slender and drooping in the young flower, but it grows much longer, becomes rigidly erect, and is considerably thickened towards the apex, in fruit: the calyx is 5-partite, the corolla has a very short tube, and a deeply 5-cleft rotate border, with the stamens arising from triangular extensions a little above the base of the tube, as in *Hebecladus* and *Saracha*: the berry is large, oval, and wholly included within the enlarged calyx, and the form of the embryo of its seed is spiral.

It may be urged that the name of *Saracha* should give place to that of *Witheringia*, but such a change would answer no good purpose, and could not be effected without great confusion, a very unnecessary creation of synonyms, and the annihilation of a genus long recognized. The recommendation above suggested appears to me the only proper course to pursue, and in adopting it, we do not violate the rule of priority, as L'Heritier's plant was only a cultivated specimen, the place of whose origin is still quite unknown; and as no specimen of it appears to be in existence, it is clear that as a species, and especially as the type of a genus, it must ever remain problematical: and finally, that as L'Heritier's generic character remains in full force, as applied to another distinct group, the tribute intended by him to honour the memory of Withering is thus inviolably preserved. The genus *Witheringia* being thus established, it follows as a necessary consequence, that the *Athenæa* of Dr. Sendtner must give place to it. The following generic character drawn up from my own observations will not be found to differ materially from that of the author last mentioned.

WITHERINGIA, L'Her., Mart. *Athenæa*, Sendt.—*Calyx* subcampanulatus, profunde 5-partitus, persistens. *Corolla* rotata, tubo brevi, limbo 5-partito, laciniis oblongis, acuminatis, æstivatione valvata. *Stamina* 5, erecta; *filamenta* filiformia, brevia, paulo supra basin corollæ inserta, imo repente triangulariter

dilatata, et hinc in annulum fere coalita; *antheræ* oblongæ, 2-loculares, basi emarginato-cordatæ, loculis connectivo angusto dorsali parallele connatis, longitudinaliter dehiscentibus. *Ovarium* ovatum, 2-loculare, ovulis plurimis, utrinque dissepimento adnatis. *Stylus* simplex, longitudine staminum, apice incrassatus, fistulosus. *Stigma* subintegrum, glandula glutinosa 2-loba semi-immersa. *Bacca* ovata, calyce aucto tecta. *Semina* compressa, rhomboideo-reniformia, in pulpam tenuem nidulantia, *testa* scrobiculata, subscabra, hilo perforato in sinu marginali. *Embryo* in *albumen* carnosum, subspiralis: *cotyledonibus* semiteretibus, *radicula* 3–4-plo brevioribus.—Frutices *Brasilienses, dichotome ramosæ*; folia *alterna, vel gemina altero minori* (*in turionibus subfasciculata*), *integra*; flores *pedunculati, axillares, vel in dichotomiis solitarii, bini, vel plures fasciculati, et tunc alterna vice singulatim tardius enati,* pedunculo fructifero *demum erecto, elongato et incrassato.*

1. *Witheringia picta,* Mart., *Nov. Gen. et Spec.* iii. 74. tab. 227. Witheringia hirsuta, *Gardn. Lond. Journ. Bot.* i. 541. Athenæa picta, *Sendtn. Flor. Bras.* fasc. vi. p. 134; *Walp. Repert.* vi. 580. —Brasilia, Prov. Rio de Janeiro et Minas Geraës.

To the long and excellent description of Von Martius above referred to, it is quite unnecessary to offer the smallest additional remark, except that Gardner's plant which I collected at the same time does not appear to me to offer any difference from that figured by Martius, and that it is a little more hairy*: if therefore it does not belong to this species, it most probably is referable to *W. pogogena.* Of the following seven species I have no knowledge whatever, beyond the short notice extracted by Dr. Walpers from Dr. Sendtner's description, to which I refer the reader.

2. *Witheringia pogogena.* Athenæa pogogena, *Sendtn. loc. cit.* p. 135; *Walp. Repert.* vi. 580. Solanum pogogenum, *Moricand, Pl. Nouv. d'Amér.* iii. 24. tab. 17.—Brasilia, Prov. Bahia.

3. *Witheringia micrantha.* Athenæa micrantha, *Sendtn. loc. cit.*; *Walp. Rep.* vi. 580.—Brasilia, Villa Vicosa.

4. *Witheringia Schottiana.* Athenæa Schottiana, *Sendtn. loc. cit.*; *Walp. Rep.* vi. 581.—Brasilia, Prov. Rio de Janeiro.

5. *Witheringia Pohliana.* Athenæa Pohliana, *Sendtn. loc. cit.*; *Walp. Rep.* vi. 581.—Brasilia, Prov. Minas Geraës.

* As Dr. von Martius's admirable work is within the reach of few persons, and as it may be desirable to compare the above with its analogous genera, I have given a figure with full details of the structure of this species, which I first collected at Tejuca in 1833, and afterwards with Mr. Gardner in 1837 (Gardn. no. 237); it is shown in Plate 35 of this work.

6. *Witheringia Martiana.* Athenæa Martiana, *Sendtn. loc. cit.*; *Walp. Rep.* vi. 581. Solanum paradoxum, *Schott MSS.*—Brasilia, Prov. Rio de Janeiro et Minas Geraës.

7. *Witheringia hirsuta* (*non Gardn.*). Athenæa hirsuta, *Sendtn. loc. cit.*; *Walp. loc. cit.*—Brasilia, Prov. Minas Geraës.

8. *Witheringia anonacea.* Athenæa anonacea, *Sendtn. loc. cit.* tab. 18; *Walp. loc. cit.*—Brasilia australis.

Brachistus.

A particular group of plants has been before alluded to under this name (*ante*, p. 4), most of which have been referred to *Witheringia* by Prof. Kunth, and from which genus I have shown that they differ by having a campanular calyx generally with an almost entire margin, which does not enlarge with the fruit, by a much smaller berry and other characters. They are also distinct from *Acnistus* by the calyx being generally entire on the margin, rarely 5-toothed, and not having the five strong prominent nervures which give to the calyx of the latter genus the appearance of an almost pentangular tube: they differ also in the much shorter tube of the corolla, a more rotate border, more dilated stamens arising from a triangular expansion at the base, as in *Hebecladus* and *Saracha*; their flowers are considerably less in size, and they have smaller berries, which exhibit a very thin membranaceous dissepiment, not thickened in the middle by the confluence of the placentæ, as in *Witheringia*, *Acnistus*, *Iochroma*, *Saracha*, &c.; the placentæ on the contrary, originating from a central line in the middle of the dissepiment, are thin and slender, projecting for a short distance at right angles into the cavity of the cell, and then become furcated, continuing membranaceous, with numerous seeds attached on each side. The ovarium is also surrounded at its base by a distinct annular disc, and is not seated simply upon a fleshy torus as in *Acnistus*. These plants appear to me closely allied to the *Physalis arborescens*, Willd., which, on account of its arborescent habit and its different form of flower, I propose to separate from that genus and attach to this group. They may thus be made to constitute a distinct genus under the name of *Brachistus*, from βράχιστος, *brevissimus*, on account of the shortness of the tube of their corolla. As *Iochroma* (which I have made to include *Chænesthes*) differs from *Acnistus* principally in the length of the tube of its corolla, so *Brachistus* on the other hand is not less distinct from that genus on account of the extreme shortness of the tube of the corolla, and its deeply cleft rotate border. This genus will first include all the species of *Witheringia* of Prof. Kunth (of which I will give below amended characters) with the exception

of *W. riparia*, which from its infundibuliform corolla is evidently an *Acnistus*, and *W. angustifolia*, which from its racemose blue flowers and other characters evidently does not belong to this genus, appertaining more probably to the same group as *Solanum montanum*. For the same reason are excluded the *W. crassifolia*, Dun., and *W. pendula*, R. and Sch. The *W. salicifolia*, Hook., is a *Capraria* according to Mr. Bentham, although it offers regular pentandrous flowers: it evidently belongs to the genus *Xuaresia* of R. and P.: the six herbaceous species of *Witheringia* of Dunal and Sprengel enumerated by Dr. Walpers (Repert. iii. pp. 31, 32), as I have before remarked, appear to me to belong to *Solanum*. The following I consider to be its generic characters:

Brachistus (gen. nov.).—*Calyx* parvus, urceolatus, margine integro, vel rarius 4–5-dentato, persistens et non augescens. *Corolla* subrotata, tubo brevi, limbo 4–5-partito, lobis oblongis acutis, æstivatione valvata. *Stamina* 4–5, erecta; *filamenta* imo subdilatata, paulo supra basin corollæ adnata; *antheræ* oblongæ, submucronulatæ, 2-lobæ, lobis arcte adnatis margine exteriore dehiscentibus. *Ovarium* ovatum, disco annulari imo cinctum, 2-loculare, dissepimento tenui utrinque in placentam membranaceam bifidam ovuligeram producto, ovulis plurimis. *Stylus* simplex, longitudine staminum. *Stigma* clavatum, sub-2-lobum. *Bacca* parva, globosa, calyce parvulo suffulta, 2-locularis. *Semina* compressa, in pulpo aquoso nidulantia, sublenticularia, *testa* aspero-scrobiculata; cætera ignota.—Arbores vel frutices *Americæ Æquinoctialis*: folia *alterna vel sæpius gemina, altero multo minori et heteromorpho, subintegra vel angulato-dentata*; flores *axillares, fasciculato-congesti, perpauci, vel rarius solitarii*, pedicellis 1-*floris, gracilibus, erectis, demum cernuis*.

1. *Brachistus stramonifolius*. Witheringia stramonifolia, *H.B.K. Nov. Gen.* iii. 13;—arboreus, ramulis angulatis, pubescentibus; foliis ovatis, acuminatis, inæqualiter cordatis et dentato-angulatis, hirtellis, geminis, altero dimidio breviore; floribus fasciculato-congestis, hirtellis, pedunculis nutantibus, 5-meris, staminibus margine pilosis, inclusis; bacca pisiformi, calycis persistentis duplo diametro.—Mexico.

The leaves are said to be 4–5 inches long, 2–3 inches broad, on a petiole 1–1½ inch: the flowers (fifteen to twenty) are aggregated in each extra-axillary fascicle, the peduncles varying from 6 to 20 lines in length; the corolla, the size of that of *Capsicum frutescens*, has an expanded 5-partite border, the mouth of the short tube being pilose, the filaments are hairy on the margins. The berries are red, globular, 3 lines in diameter, and are supported by their small persistent calyx on slender deflexed peduncles.

2. *Brachistus macrophyllus.* Witheringia macrophylla, *H. B. K. loc. cit.* 14;—fruticosus, ramulis subangulatis, tenuissime puberulis ; foliis ovato-ellipticis, subacuminatis, subrepandis, glabriusculis, superioribus geminis, altero minore ; floribus plurimis, fasciculato-congestis, petiolo dimidio brevioribus, 4-meris, glabris, pedunculis filiformibus cernuis ; corollæ tubo brevi, limbo 4-partito, patente, filamentis margine villosis ; bacca minima, calyce parvulo suffulta.—Nova Granada.

The leaves are stated to be 8 inches long and about 4 inches broad, somewhat smooth, but slightly woolly on the primary nervures, and supported on a petiole 14–15 lines long, which is slender, caniculate and pubescent. The flowers are numerous in each fascicle upon slender, smooth peduncles 4–5 lines long. The calyx is small, almost entire or obsoletely 4-toothed, and quite smooth. The corolla, not larger than that of *Solanum nigrum*, is of a greenish hue, with a very short tube, a rotate border with four pointed lobes, the included filaments being very short, flattened and ciliate on the margins ; the anther lobes are adnate, lanceolate, pointed, erect, and bursting on the margins. The ovarium is small, rounded, smooth, and seated on a glandular disc. The berry is red, not larger than a peppercorn, and supported upon its small calyx.

3. *Brachistus ciliatus.* Witheringia ciliata, *H. B. K. loc. cit.* 15. —fruticosus, ramis teretibus, glabris ; foliis oblongis, acutis, basi angustatis, integerrimis, ciliatis, geminis, altero duplo minore ; floribus 5-meris, parvis, paucis (1–2), extra-axillaribus, pedunculis capillaceis pubescentibus ; calyce urceolato obsolete dentato, dentibus linearibus pubescente ; corolla glabra, tubo brevi, limbo angulato sub-5-lobo patente, lobis acutis ; bacca globosa, calyce parvulo suffulta.—Nova Granada, in Andibus excelsis.

This plant bears very much the appearance of *Solanum phillyreoides*, Dun. The leaves are smooth, thin and membranaceous, ciliate on the margins, $1\frac{1}{2}$ inch or more in length, 7 lines broad, on a pubescent petiole 4–5 lines long. The flowers, solitary or binate, are about the size of those of the last species, the very slender peduncles measuring 8–9 lines : the pubescent calyx is almost entire on the margin, with five nearly obsolete erect teeth, the filaments are short, quite smooth and dilated below, the anthers oblong, obtuse, erect, bursting on the margins.

4. *Brachistus mollis.* Witheringia mollis, *H. B. K. loc. cit.* 15. —fruticosus, ramulis teretibus, cano-tomentosis ; foliis ovatis utrinque acuminatis, integerrimis, supra pubescentibus, subtus molliter cano-tomentosis, geminis, altero multo minore et dif-

formi; floribus 5-meris, extra-axillaribus (2–3–4), pedunculis filiformibus, elongatis, cernuis; corollæ tubo brevi, limbo angulato sub-5-lobo, laciniis acutis, staminibus glabris inclusis; bacca minima, calyce parvulo suffulta.—Caxamarca, Peruviæ.

The leaves of this species are from $1\frac{1}{2}$ to 2 inches long, and 9 to 12 lines broad, on a tomentose petiole 3 lines long. The peduncles, from 9 to 11 lines in length, are slender, hairy, dependent, but erect in fruit; the flowers are the size of those of the two former species; the calyx is urceolate, incano-tomentose, with five short linear teeth; the corolla is hairy outside, has a plicate and a somewhat pentangular limb with acute angles; the stamens, five or six, are short, smooth and erect; the berry, not larger than a peppercorn, is supported on its very small persistent calyx.

5. *Brachistus rhomboideus.* Witheringia rhomboidea, *H. B. K. loc. cit.* 15.—fruticosus, ramis teretibus, tomentosis; foliis ovatis, acutiusculis, basi rotundatis et inæqualibus, integerrimis, supra molliter pubescentibus, subtus cano-tomentosis, geminis, altero minore; floribus paucis (4–6), extra-axillaribus, fasciculatis, pedunculis filiformibus petiolo longioribus; corolla rotata, limbo 5-fido, laciniis acutis, apice hirtellis.—Nova Granada (Quindiu).

The branches of this species are said to be somewhat scandent; the leaves are scarcely 1 inch long, $\frac{3}{4}$ inch broad, upon cano-tomentose petioles 2 to 5 lines in length: the peduncles are 4 or 5 lines long, cernuous in flower, erect and 7 to 8 lines long in fruit. The flowers are the size of those of the three foregoing species; the calyx, cano-tomentose, is urceolate, with a nearly entire margin, and five short linear distant teeth: the corolla is glabrous, with a rotate 5-fid border, the segments being oblong, acute and hairy at the apex; the filaments are subulate, short and smooth.

6. *Brachistus dumetorum.* Witheringia dumetorum, *H. B. K. loc. cit.* 16.—fruticosus, ramulis subangulatis, junioribus tomentosis; foliis ovatis, subacuminatis, basi cuneatis, supra hirto-pilosis, subtus hirto-tomentosis et canescentibus, superioribus geminis, altero minore; floribus geminis aut ternis, extra-axillaribus, pedunculis filiformibus, tomentosis, petiolo multo longioribus; corolla rotata, limbo 5-fido, laciniis brevibus, acutis, apice hirtis; staminibus inclusis, glabris.—Nova Granada.

The leaves have a somewhat obtusely pointed acuminated apex, and are gradually contracted at base upon a short and caniculate tomentose petiole of 2 lines in length; they are from 12 to 16

lines long and 6 to 8 lines broad, somewhat coriaceous, with parallel nervures, which with the midrib are prominent beneath. The peduncles are 3 to 5 lines long, filiform and tomentose; the flowers are the size of those of the preceding species, the calyx of which it also resembles in form; the corolla is rotate, smooth and plicated; the filaments are very short, subulate and smooth.

7. *Brachistus riparius.* Witheringia riparia, *H. B. K. loc. cit.* 16.—fruticosus, ramulis angulatis, hispido-pilosis; foliis suboblique obovato-oblongis, acuminatis, basi acutis, supra glabris et læte viridibus, subtus in rachin pilosis, geminis, altero multo minore; floribus plurimis, fasciculatis, congestis, extra-axillaribus, petiolum subæquantibus; corollæ tubo calyce duplo longiore, infundibuliformi, limbo 5-partito; bacca sphærica.—Nova Granada (Andibus Quindiuensibus, alt. 6300 ped.).

This species, from the greater length of its corolla, might be referred to *Acnistus*, did not the habit of the plant show it to be congeneric with the above-mentioned species described by Prof. Kunth. The larger of the geminate leaves are from 8 to 10 inches long, $2\frac{1}{2}$ to $3\frac{1}{2}$ inches broad, upon petioles 5 to 8 lines long, caniculate and hispid; the smaller leaves in each pair are only $1\frac{1}{2}$ to 3 inches long, upon a much shorter petiole, and they are elliptic or ovate-elliptic, and acute at both ends. The flowers are fasciculated upon distinct peduncles, and are about the size of those of *Lycium barbarum*. The calyx is urceolate, obsoletely 5-toothed, thin and smooth; the corolla is of a greenish white colour, smooth, the border divided into five equal divisions; the filaments are pilose at base, the anthers oblong, bursting longitudinally; the style is smooth and longer than the stamens.

8. *Brachistus hebephyllus* (n. sp.);—fruticosus, ramulis teretibus, elliptico-lanceolatis, attenuato-acuminatis, basi subcuneatis, integris, utrinque molliter incano-pubescentibus; floribus plurimis, parvulis, 4-meris, axillaribus, fasciculatis, pedunculis filiformibus, petiolo subæqualibus, pilosis; calyce piloso, urceolato, margine integro, ciliato; corolla rotata, laciniis 4, oblongis, acutis, margine ciliatis, tubo brevi, intus pilosulo, staminibus brevibus, erectis: ovario ovato, disco annulari insito: stylo staminibus superante, subincurvo; stigmate clavato; bacca parva, calyce minimo suffulta.—Nova Granada, *v. s. in herb. Hook.* (Los Tapios, Quindiu, *Goudot, sub nomine "Witheringia mollis, H. B. K."*)

This species, although approaching the *Witheringia mollis*, H. B. K., is certainly distinct from it in the form and size of its leaves, and its much smaller flowers, which are 4-merous: it has also an entire calyx. The leaves are 3 to $3\frac{3}{4}$ inches long, and

about 1 or $1\frac{1}{4}$ inch broad, upon a petiole from 5 to 9 lines in length; the flowers, from 6 to 10 or more, are crowded in each axil, the pedicels being 5 lines in flower and 7 lines in fruit, they are pubescent and erect; the corolla has a short tube with a 4-fid expanded border; the filaments are gradually dilated to the base, smooth and somewhat pilose at the point of their insertion in the middle of the short tube, which is there pubescent; the anthers are ovate, cordate, acute, adnate, and terminated by a sharp point; the style is long, slender and exserted, somewhat incurved, with a small clavate stigma; the ovarium is ovate, and surrounded at the base by an annular fleshy ring; the berry is about the size of a peppercorn, supported on its smaller persistent withered calyx; the dissepiment and bifurcate placentæ are membranaceous: the seeds were too immature to determine the form of the embryo*.

9. *Brachistus oblongifolius* (n. sp.);—fruticosus, ramulis teneris, teretibus, glabris; foliis oblongis, utrinque acuminatis, omnino glabris, breviter petiolatis, inferioribus subcoriaceis, rugoso-venosis, superioribus planiusculis, submembranaceis, geminis, altero tertio vel quarto minore, rhomboideo-ovato, breviter petiolatis; floribus pentameris paucis, fasciculatis (2–4), pedunculis subcernuis, petiolo æquilongis; calyce urceolato, brevissime 5-dentato, glabro; corolla tubulosa, breviter infundibuliformi, limbo 5-lobo expanso, laciniis acutis, staminibus vix inclusis, filamentis filiformibus, medio tubi insertis, tubo hinc pubescente, aliter intus glabro.—Nova Granada, *v. s. in herb. Hook.* (Pantano del Moral, Ibague, *Goudot*.)

The larger leaves are 5 inches long and 2 inches broad, on a petiole of 4 lines; the smaller leaves measure $2\frac{1}{2}$ inches long and $1\frac{1}{2}$ inch broad, on a petiole of 3 lines; the peduncles are from 4 to 6 lines long; the calyx urceolate, 1 line long; the tube of the corolla 3 lines, its segments 2 lines long†.

10. *Brachistus dimorphus* (n. sp.);—fruticosus, ramulis teretibus, glaberrimis; foliis elongato-lanceolatis, apice acuminatissimis, basi oblique in petiolum attenuatis, adultis utrinque glabris, supra ad rachin scabrido-pilosis, margine subciliatis, junioribus sparse pilosis, geminis, difformibus, altero multo minori, rotundato-ovato, sessili, basi inæquali, supra glabro, subtus pallide fulvescente; floribus pentameris binis, extra-axillaribus, cernuis, petiolo brevioribus; calyce urceolato, fere integro, pubescente; corollæ tubo brevissimo, limbo 5-partito, expanso, lobis acutis; filamentis subulatis, compressis, glabris; antheris

* A figure of this species with generic details is given in Plate 36 of this volume.

† This species is represented in Plate 37 A.

oblongis; stylo exserto, subincurvo; stigmate clavato, sub-2-lobo.—Nova Granada, *v. s. in herb. Hook.* (Los Tapios, Quindiu, *Goudot.*)

This species is very distinct, its larger leaves being so extremely different in form from the others; they are $3\frac{1}{2}$–$3\frac{3}{4}$ inches long, $\frac{3}{4}$ inch wide, on a petiole barely $\frac{1}{2}$ inch in length, the smaller geminate leaf being 10 lines long and 7 lines broad; the peduncle is scarcely 2 lines, and the corolla 2 lines in length; the calyx is 1 line long and in diameter, submembranaceous, without nervures, and with five obsolete teeth on its almost entire margin*.

11. *Brachistus? lanceæfolius* (n. sp.);—ramis ferrugineo-tomentosis, dichotomis, ramulis angulatis, divaricatim flexuosis, vix ligneis; foliis alternis, lanceolatis, utrinque acuminatis, integris, supra parce, subtus densius fulvo-puberulis, petiolo subbrevi; floribus e dichotomiis solitariis, vel e turionibus fasciculatis; pedunculis 1–4, unifloris, pilosis, apice incrassato-incurvis; calyce piloso brevi, urceolato, angulato, margine fere integro, dentibus 5 minimis instructo; corolla rotata, subglabra, limbo 5-lobo, lobis acutis, triangularibus, reflexis, margine floccosis; staminibus inclusis, erectis, glabris; stylo apice incrassato, stigmate capitato-bilobo.—America æquinoctialis, *v. s. in herb. Hook.* (Loxa, regno Quitensi, *Seemann*, p. 879.)—(Vita, Peruviæ, *McLean.*)

This is a plant very distinct from the others, with very dichotomously spreading branches, which have a more medullary and less ligneous substance: there is no indication of fruit in the specimens referred to, but the structure of the flower corresponds with that of all the plants above described. The leaves are $2\frac{3}{4}$–$3\frac{1}{2}$ inches long, 1–$1\frac{1}{2}$ inch broad, upon a petiole 4–6 lines in length; the peduncle measures $\frac{3}{4}$ inch, the calyx 3 lines in diameter; the corolla, including the acuminated segments, is $\frac{3}{4}$ inch diameter.

12. *Brachistus Hookerianus* (n. sp.);—fruticulosus, ramulis striatis, molliter pilosis, demum glabris; foliis ovatis, utrinque abrupte acuminatis, imo in petiolum longe decurrentibus, utrinque sparse molliter hirsutis, demum subglabris, margine ciliatis, rachi incrassato venisque pinnatis glabris, geminis, altero multo minore; floribus pentameris, parvulis, axillaribus, fasciculato-congestis; calyce minimo, pubescente, margine integro, dentibus 5, setaceis; corolla lutea, glabra, tubo brevi, subcampanulato, limbo rotato, 5-angulato, angulis acutis, pilosulis; staminibus brevibus, glabris.—Ecuador, *v. s. in herb. Hook.*

* A drawing of this species is shown in Plate 37 B. of this work.

(Cerro de Lantana, Guayaquil, *Jameson*, et *in horto Kewensi cultus*.)

This pretty species is remarkable for the abundance and brilliancy of its small yellow flowers. Its leaves are $2\frac{3}{4}$ inches long, $1\frac{1}{2}$ inch broad, with a somewhat winged petiole $\frac{3}{4}$ inch long; the peduncle measures 7 lines, the calyx 1 line, with remote setaceous teeth $\frac{1}{2}$ a line in length; the corolla is 5 lines in diameter.

13. *Brachistus diversifolius*. Witheringia diversifolia, *Klotsch MSS.*; *Walp. Rep.* iii. 29;—suffruticosus, ramis teretibus, subglabris, ramulis pubescentibus; foliis ovatis, acutis, basi abrupte attenuatis, utrinque sparsim pubescentibus, plerumque geminis, altero obtusissimo duplo minori; pedunculis axillaribus, solitariis, calyce 5-dentato, corolla lutea, 5-fida.—Mexico.

This plant was cultivated in the Botanic Garden of Berlin, from whence the particulars of the above description are probably derived.

14. *Brachistus Neesianus*. Physalis arborescens, *Linn. Sp. Pl.* 261; *Nees ab Esenb. Linn.* vi. p. 456;—suffruticosus, ramulis angulatis, tomentosis; foliis alternis, superioribus geminis, ovato-oblongis, acumine obtusiusculo, attenuatis, inæqualiter repando-dentatis, crassiusculis, supra subtiliter, subtus densius tomentosis, pilis canis, stellatis; floribus paucis (2–3), extra-axillaribus, pendulis; calyce urceolato, pubescente, 5-fido, dentibus ovatis, obtusiusculis, canescentibus; corolla rotata, ultra medium 5-fida, laciniis lanceolatis, extus tomentellis; fructu ignoto.—Mexico (Yucatan).

This plant has always been referred to *Physalis*, but doubtfully by Nees, who hardly considered it to belong to that genus, on account of its manifestly fruticose habit, and the different structure of its flowers: with *Brachistus* it appears to correspond sufficiently, although nothing is yet known of its fruit. Willdenow considers this plant the same as that figured in Miller's Dict. tab. 206. Tab. 20*, but Nees holds a contrary opinion (Linn. *loc. cit.* p. 441), principally on account of its leaves being opposite; it is however most likely that its geminate leaves may have been mistaken by Miller as opposite.

The leaves are said to be 2 inches long, 1 inch broad, on a petiole $\frac{1}{2}$–$\frac{3}{4}$ inch in length; the peduncles are 2–$2\frac{1}{2}$ lines long, the calyx scarcely $2\frac{1}{2}$ lines; the corolla, including the lobes, is $3\frac{3}{4}$ lines in length.

15. *Brachistus ? Linnæanus*. Physalis arborescens, *Linn. Sp. Pl.*

* "Physalis foliis ovato-lanceolatis, integerrimis, oppositis, caule fruticoso."

161 ; *Spr. Syst. Veg.* i. 696 ;—caule arborescente ; foliis ovatis, subangulatis, subtus lanatis ; floribus solitariis.—Mexico.

This species is excluded by Nees (Linn. vi. 483) from *Physalis*, and considered by him as altogether distinct from the foregoing. From the above short character it is impossible to come to any decided opinion on the subject.

Saracha.

To this genus of the 'Flora Peruviana' I have to contribute several new species. In the Prodromus of that work, p. 31, tab. 34, in order to illustrate the character of *Saracha*, its distinguished authors selected the plant which on a former occasion (*huj. op.* vol. i. p. 152) I proposed to detach from that genus, because, as it differed essentially in structure and in habit from all the other species enumerated by them, it could not be regarded as its type. I preferred therefore to exclude that plant and retain the genus for the other several well-recognized and long-established species, as it would produce much confusion and answer no good purpose to make any change in their present arrangement. I now proceed accordingly to modify the generic character in the following manner, so as to include all the species below enumerated. Before doing this I will offer a few remarks in regard to the limits of this genus with respect to *Physalis*, *Withania*, *Capsicum*, &c. on the one hand, and *Witheringia* and *Brachistus* on the other. In all these instances there exists but little difference in the structure of the flower, the principal distinctive features being the inclosure of the berry in a greatly enlarged and ventricose calyx in *Physalis* and *Withania*, another structure of fruit in *Capsicum*, and a more fruticose habit and different inflorescence in *Witheringia* and *Brachistus*. In *Saracha* the inflorescence is axillary and umbellate, the number of radiating pedicels upon one single peduncle varying from 2 to 8 : in *Physalis* the flowers are always solitary in each axil, upon a lengthened peduncle ; and in *Witheringia*, as I have limited that genus (*ante*, p. 4), the flowers, though more numerous, are also upon simple peduncles : in this case however the inflorescence appears to be somewhat more complex, owing to several flowers growing out of each axil at successive periods, so that they are seen in various stages of development, from the nascent bud to the perfected fruit ; but the true normal condition is that of a solitary pedunculated flower, as is frequently observed in the dichotomous axils, the other flowers commonly aggregated with it in many of the axils being in fact nothing more than a shortened and dwarf form of an axillary flowering branchlet, which is often seen in a more lengthened state of development. This is distinctly shown in the

figure of *Witheringia*, plate 35, attached to this volume. In *Physalis* the corolla is generally campanulate, with an almost entire pentangular border, rarely 5-lobed; in *Witheringia* the tube is very short, the border patent and cleft nearly to the base into five equal oblong acute segments, while in *Saracha* the corolla is contracted at its base into a short tube, and suddenly spreads above into a border quite rotate, which is pentangular or half cleft into five lobes. In the latter genus the stamens are generally slender and distinct at their origin, being simply inserted at the base of the tube of the corolla; in *Witheringia, Capsicum*, and in several species of *Solanum*, they spring, as in *Hebecladus*, from as many triangular expansions, sometimes separated by small distinct intervals, at others almost or wholly united into an annular ring adnate to the tube a little above its base: in *Witheringia* these processes are most distinctly developed; in *Saracha* the same occurs in a greater or less degree, but they are generally more separated and completely free, arising from the marginal base of the tube; in *Physalis* these expansions are quite adnate with the tube. In *Saracha*, as in *Hebecladus*, the berry is supported by the persistent calyx, which although more or less expanding in size with the growth of the fruit always remains rotate, not vesicular and inclosing the berry as in *Physalis*, *Nicandra* and some other genera. In *Saracha*, as in these genera, and also as in *Witheringia*, the placentæ are fleshy and altogether adnate with the dissepiment, but in *Brachistus* the placentæ are thin, membranaceous, and branching at right angles from the axile line of the dissepiment into the cavity of the cell, when they are free, furcated and ovuligerous. In *Saracha* and in *Physalis* the embryo is semicyclical, the radicle being double the length of the cotyledons; in *Capsicum* it is quite spiral and somewhat helical, the cotyledons being equal in length to the radicle; but the latter describes only a half-circuit of much larger radius, while the former makes fully a complete gyration of smaller diameter. In *Witheringia* the embryo is subannular, forming nearly $\frac{3}{4}$ths of a circle by no means spiral, and the cotyledons are only $\frac{1}{4}$th of its whole length. The following I conceive to be the limits of this genus:—

Saracha, R. & P., char. emend.—*Calyx* brevis, submembranaceus, 5-angulatus, 5-dentatus, 5-nervosus, dentibus acutis brevibus, persistens. *Corolla* rotata, limbo sinuato, 5-angulato, sæpissime 15-nervio, lobis s. angulis reflexis, æstivatione valde induplicato-valvata. *Stamina* 5, tubo corollæ prope marginem basalem affixa, ejusdem longitudine; *filamenta* filiformia, erecta, basi triangulariter dilatata; *antheræ* approximatæ, oblongæ aut subrotundæ, basifixæ, 2-lobæ, lobis arcte connatis et longitudinaliter antice dehiscentibus. *Ovarium* ovatum,

2-loculare, placentis incrassatis septo adnatis, multiovulatis. *Stylus* simplex, longitudine staminum. *Stigma* capitato-bilobum. *Bacca* globosa, calyce membranaceo parum aucto suffulta. *Semina* plurima, in pulpam nidulantia, parva, reniformia: *testa* scrobiculata, hilo in sinu laterali: *embryo* intra albumen carnosum semicyclicus, teres, cotyledonibus uncinatis semiteretibus, radicula paulo inflexa infera hilo evitante dimidio brevioribus.—Herbæ *Americæ intertropicæ plerumque perennes, procumbentes, dichotome ramosæ, pilosæ*; folia *alterna vel gemina, integra, aut sinuato-dentata*; inflorescentia *umbellata*, pedunculo 2–6-*floro, axillari vel e dichotomiis sæpius orto.*

The following recorded species from the characters described appear to belong to this genus:—

1. *Saracha procumbens*, R. & P. Flor. Per. 2. 43. tab. 180 *b*.
2. ——— *umbellata*, DC. Jacq. Hort. Schoen. tab. 493.
3. ——— *contorta*, R. & P. *l. c.* tab. 180 *a* *.
4. ——— *jaltomata*, Schl. Linn. 13. Litt. 98; Linn. 19. 307.
5. ——— *Zuccagniana*, R. & Sch. Syst. 4. 687.
6. ——— *villosa*, G. Don, R. & Sch. Syst. 4. 684.
7. ——— *dentata*, R. & P. *l. c.* 2. 43. tab. 179 *b*.
8. ——— *biflora*, R. & P. *l. c.* 2. 42. tab. 179 *a*.
9. ——— *viscosa*, Schrad. Sweet. Br. Fl. Gard. (2nd ser.) 4. tab. 323; Botanist, 4. tab. 168.
10. ——— *pubescens*, Willd. R. & Sch. Syst. 4. 687.
11. ——— *allogona*, Schl. Linn. 19. 308. *Solanum allogonum*, Bernh. Linn. 8. 252; Walp. Rep. 3. 48.

From this list are excluded *S. punctata*, R. & P., referred to *Pœcilochroma* (vol. i. of this work, p. 153), and *S. geniculata*, Mart. & Gall. Bull. Ac. Br. 12. 1. 133; Walp. 6. 575, which is evidently referable to *Physalis*, on account of its solitary pendulous flowers and yellow corolla with large purple spots. Galeotti's Mexican plant, no. 1226, is said by Schlechtendal (Linn. 19. 308) to be the *Saracha angulata*, Linn., which is clearly a typical error, instead of *Physalis angulata*, Linn. Among the doubtful or undescribed species of *Saracha* may also be mentioned as of no value for want of sufficient details, *S. brasiliensis*, Klotzsch, Linn. 14. 290; *S. micrantha*, DeC. Cat. Hort. Monsp. 1813; *S. peruviana*, D. Diet. Gärtnerlexicon, 8. 525.

The following new species are now to be added to this genus:

12. *Saracha ciliata* (n. sp.);—caule angulato, glabro, vel sparse aspero-pilosulo, dichotome ramoso; foliis geminis, oblongis, utrinque attenuatis, subglabris, aut leviter glanduloso-asperis, eroso-denticulatis, et ad marginem ciliatis, breviter petiolatis; pedunculo brevi, axillari, vel e dichotomiis orto, umbellatim

* Mathews, no. 3248.

2-floro, pedicellis apice incrassatis, pilosis; calyce majusculo, 5-partito, fere glabro, in nervis piloso, laciniis acutis; corolla ampla, pallide lutea, rotata, angulato-5-loba, lobis acutis, glabra, sed in nervis 15 extus pilosa, staminibus corollæ dimidio brevioribus, glabris.—Peruvia, *v. s. in herb. Hook.* (in valle Limæ, *Mathews, n.* 834).

This plant in its habit much resembles *S. diffusa*, but it is different in the form of its leaves, and in its much larger pale yellow flowers, with comparatively short, glabrous stamens and large anthers. Its leaves are $1\frac{3}{4}$ inch long, $\frac{7}{8}$ inch broad, on a petiole $\frac{1}{4}$ inch long: the peduncle is 4 lines long, and its much thicker pedicels are of equal length: its broadly spread campanular calyx is half an inch long, cleft nearly half way into five equal acute segments: the corolla is probably the largest of the genus, measuring in diameter nearly 2 inches, with five deep acute lobes, the stamens being quite glabrous, erect, and 4 or 5 lines long.

13. *Saracha propinqua* (n. sp.);—herbacea, caule dichotome ramoso, glabro; foliis lanceolato-ellipticis, margine eroso-denticulatis, utrinque sparse glanduloso-asperis, petiolo gracili, pubescente; pedunculo elongato, gracili, umbellatim 2–6-floro, axillari vel e dichotomiis orto, vix pubescente, pedicellis longis, filiformibus; calyce rotato, lobis acutis; corolla cærulea, rotata, angulato-5-loba, lobis acutis, staminibus erectis, elongatis, imo pilis mollibus patentibus dense hirsutis: bacca pisiformi, calyce rotato suffulta.—Peruvia, *v. in herb. Hook.* (Cuesto de Purruchucho, *Mathews, no.* 774, S. procumbens *nominata*.)

This plant is certainly very distinct from the *S. procumbens* of the 'Flora Peruviana,' and does not appear to correspond with any recorded species. The leaves are 2 inches long and 1 inch wide, with its broadest part towards the base, which is suddenly attenuated into a somewhat fine petiole 4 lines in length. The slender peduncle almost glabrous, striated and shining, is about an inch long, bearing on its summit the very delicate pedicels, umbellately spreading, and $\frac{3}{4}$ inch in length: the calyx measures very nearly half an inch across, and the rotate corolla is 1 inch in diameter, the stamens being $\frac{3}{4}$ inch long, very slender, smooth at the summit, while the lower moiety is densely pilose with very spreading articulated dark-coloured hairs: the round berries are about 4 lines in diameter, supported on their spreading, scarcely enlarged calyx*.

14. *Saracha diffusa* (n. sp.);—herbacea, caule angulato, glabro, dichotome ramoso; foliis ovatis vel ellipticis, versus apicem

* A drawing of this species with generic details is given in plate 38 B of this work.

attenuatis, et saltim obtusiusculis, grosse sinuato-serratis, lacinulis obtusis, margine eroso-denticulatis et ciliatis, basi subinæqualibus, in petiolum gracilem angustissime decurrentibus, submembranaceis, reticulato-venosis, vix glabris, vel utrinque præsertim in venis glanduloso-pilosis; floribus in dichotomiis umbellatis, 4–6 floris, pedunculo elongato gracillimo, pedicellisque filiformibus glabris; calyce rotato, angulato, 5-dentato; corolla rotata, 15-nervia, extus lanuginosa, margine 5-angulata, longe ciliata, staminibus erectis, corollæ dimidio brevioribus, glabris.—Peruvia, *v. in herb. Hook.* (Cuesta de Purruchucho, *Mathews, no.* 775, S. contorta *noncupata*.)

This species clearly does not correspond with the *Saracha contorta* of the 'Flora Peruviana,' agreeing neither with its figure nor its description. The leaves, which are remarkable not only for their sinuose serrate border, but for their distinctly eroso-ciliate margins, are $2\frac{3}{4}$ inches long, $1\frac{1}{2}$ inch broad, with a petiole half an inch in length: the peduncle of the umbel is from $\frac{3}{4}$ to 1 inch or sometimes $2\frac{1}{2}$ inches, and the pedicels $\frac{3}{8}$ inch long: the very expanded flower measures 8 lines in diameter. The whole plant appears herbaceous and almost glabrous, and is said to flower in April.

15. *Saracha laxa* (n. sp.) ;—caule angulato-striato, subglabro vel parce puberulo, dichotome ramoso : foliis late ovatis, basi subobtusis, repente in petiolum attenuatis, utrinque squamoso-pilosis, pilis articulatis; floribus umbellatis, pedunculo axillari, elongato, pedicellisque 2–6 tertio brevioribus, pilosis; calyce acutilobo, hirsuto; corolla rotata, angulato-5-loba, lobis acutis, utrinque glabra; staminibus dimidio brevioribus; bacca pisiformi, calyce rotato aucto suffulta.—Mexico, *v. in herb. Hook.* (Oaxaca, *Galeotti, no.* 1169.)

The branches of this plant are straight and slender, the internodes being very distant ($4\frac{1}{2}$ inches apart); the leaves are $1\frac{3}{4}$ inch long and $1\frac{1}{4}$ inch broad, upon a petiole half an inch in length; the peduncle is 2 inches long, slender, the pedicels being $\frac{3}{4}$ inch in length; the calyx is cleft half way down, and is about 3 lines broad; the corolla when spread measures nearly an inch in diameter.

16. *Saracha auriculata* (n. sp.) ;—caule angulato, dichotome flexuoso, glaberrimo, rubescente; foliis geminatis, rhomboideo-lanceolatis, acuminatis, imo in petiolum cuneatis, infra medium acutato-auriculatis, et irregulariter grosse sinuato-dentatis, utrinque glabris, subtus nervis prominulis, margine subciliatis; umbella sub-6-flora, pedicellis pedunculo axillari æquilongis, glabris, apice incrassatis; corolla parvula, rotata, 5-angulata,

lutea, glabra, margine ciliata; staminibus corollæ æquilongis, imo hirsutulis; bacca pisiformi, calyce subaucto rotato suffulta. —Nova Granada, *v. in herb. Hook.* (Plages de Combayma, *Goudot.*)

This species is very distinct, being entirely glabrous: its leaves are $3\frac{1}{4}$ inches long, 1 inch broad in the middle, and $1\frac{3}{4}$ inch across the very acute and somewhat auricular lobes, the petiole being $\frac{1}{2}$ inch in length; the peduncle and pedicels are each $\frac{3}{4}$ inch long; the calyx is 2 lines in length, becoming 6 lines in diameter in fruit; the small yellow rotate corolla is only 5 lines in diameter, the stamens being 3 lines long; the berry is globular, 3 to 4 lines in diameter*.

17. *Saracha glabrata* (n. sp.);—caule stricto, glabro, angulato; foliis geminis, oblongis, utrinque attenuatis et glaberrimis, submembranaceis, reticulato-venosis, obsolete denticulatis, nervo marginali ciliatis, petiolo caniculato glabro; pedunculo axillari, 2-floro, pedicellisque æquilongis pubescentibus; bacca pisiformi, calyce persistente rotato, reticulato, semi 5-fido, lobis triangularibus, margine nervisque ciliatis, suffulta.—Mexico, *v. in herb. Hook.* (*Dr. Coulter, no.* 1226.)

The leaves of this species are $1\frac{3}{4}$ inch long and $\frac{3}{4}$ inch broad, on a petiole $\frac{3}{8}$ inch in length. The peduncle is half an inch long, the pedicels $\frac{5}{8}$ inch in length, and the calyx nearly half an inch in diameter.

18. *Saracha conspersa* (n. sp.);—caule dichotome ramoso, angulato-striato, pubescente; foliis geminatis, oblongis, acuminatis, basi subobtusiusculis, repente attenuatis et in petiolum elongatum decurrentibus, utrinque molliter pubescentibus, nervis patentim pilosis, margine subrevoluto ciliatis; floribus umbellatis, pedunculo axillari petiolo duplo longiore, pedicellis 4–6 dimidio brevioribus, patentim radiatis; calycis laciniis lineari-acutis, patentim villosis; corolla rotata, viridi-lutea, maculis plurimis viridibus ad medium notata, glabra, 5-angulata, angulis acutis, margine ciliata, staminibus glaberrimis, erectis, corollæ æquilongis.—Mexico, *v. in herb. Hook.* (*Dr. Coulter,* Zimapan, *no.* 1227.)

The leaves of this plant are $2\frac{3}{4}$ inches long, $1\frac{1}{4}$ inch broad, on a pilose slender petiole half an inch in length; the peduncle is $1\frac{1}{3}$ inch, the pedicels $\frac{1}{2}$ to $\frac{5}{8}$ inch long, the calyx 2 lines, the corolla $\frac{3}{4}$ inch in diameter, and the stamens $\frac{1}{4}$ inch in length.

19. *Saracha acutifolia* (n. sp.);—caule angulato, fere glabro; foliis lineari-lanceolatis, grosse inciso-serratis, apice acumina-

* This species is shown in plate 38 A.

tissimis, imo in petiolum attenuatis, utrinque in nervis margineque sparse pilosis ; floribus axillaribus, foliis dimidio brevioribus, pedunculo gracili, sub 2-floro ; calyce acutilobo, hirsutulo ; corolla rotata, 5-angulata, lutea, glabra, margine ciliata, intus imo maculata et tomentosa, staminibus brevioribus, filamentis glabris, antheris iisque æquilongis.—California, *v. in herb. Hook.* (*Dr. Coulter, no.* 593.)

The specimen above noticed is not more than 4 inches in length, and is probably only a fragment, but the plant would seem to be very small in its growth : the leaves are $1\frac{1}{2}$ inch long, 5 lines wide in their broadest part, with about five deeply incised teeth on each side; the petiole measures only $\frac{1}{4}$ inch, the hairs are very short and scabrid, and are seen chiefly on the nervures and margin ; the calyx is very short with acute lobes, about a line long ; the corolla across its mouth measures about $\frac{5}{8}$ inch in diameter, the filaments are 2 lines, the anthers $1\frac{1}{2}$ line, and the pistil 3 lines long : the peduncle and pedicels together measure about half an inch.

20. *Saracha vestita* (n. sp.) ;—caule fere suffruticoso, molliter tomentoso-hirtello ; foliis oblongis, apice attenuato-acuminatis, basi obtusiusculis, margine eroso-denticulatis, utrinque tomentosis, breviter petiolatis, petiolis pedunculisque pilis patentibus articulatis flavidis dense sericeis ; pedunculo axillari, sub-brevi, 2-floro ; calyce piloso, 5-dentato ; corolla rotata, 5-angulata, extus margineque pubescente ; staminibus pilosis ; bacca pisiformi, calyce subaucto rotato suffulta.—Columbia, *v. in herb. Hook.* (*Hartweg, no.* 1292.)

Judging from the specimen above referred to, this plant would appear to be almost erect, and different from the usually straggling dichotomous growth of this genus, but in the structure of the flower and of the seed it accords entirely with *Saracha*. The leaves are $1\frac{1}{2}$ inch long, $\frac{3}{4}$ inch broad, upon a very short petiole of 4 or 5 lines ; the very sericeous peduncle with its two pedicels are scarcely longer than half an inch ; the calyx in flower measures $\frac{3}{8}$ inch in diameter, increasing in fructification to a diameter of $\frac{3}{4}$ inch ; the corolla barely measures $\frac{3}{4}$ inch across, and three parallel nervures extend from the apex of each segment to the base ; the fruit is from 3 to 4 lines in diameter.

21. *Saracha glandulosa* (n. sp.) ;—glanduloso-pubescens ; foliis alternis, floralibus subgeminis, oblongis, acuminatis, in petiolum longiusculum attenuatis, inæqualiter grosse serratis et eroso-denticulatis, crassis, utrinque tomentosis, nervis patentim pilosis, margine glanduloso-ciliatis, superioribus subintegris ; pedunculo brevi, axillari, 2-floro, pedicellis æquilongo ; calyce

5-fido; corolla parva, rotata, flava, utrinque subpubescente, angulato-5-loba, lobis acutis; staminibus inclusis, filamentis brevibus, imo dilatatis, pilosis, antheris ovalibus, conniventibus. —Nova Granada, *v. in herb. Hook.* (La Peña, Bogota, *Goudot.*)

This is the plant elsewhere mentioned as appearing to me to bear so close an analogy with the figure and character of *Witheringia solanacea* (L'Herit.). Its leaves are $2\frac{1}{4}$ inches long, 1 inch broad, on a somewhat slender petiole 9 lines to an inch in length: the peduncle and pedicels together scarcely measure more than 3 lines, the flower being no more than 4 lines in diameter; the stamens, scarcely a line long, are shorter than the somewhat campanular base of the corolla, the filaments are suddenly dilated into triangular processes at base, and united into a short adnate ring; above they are flat and narrow, the margins being clothed with diverging ciliate hairs; the anthers are oval, adnate to a small oblong dorsal connective, and they burst on the edges by longitudinal fissures *.

22. *Saracha solanacea.* Witheringia solanacea, *L'Herit. Stirp. Nov. Angl.* 1. 33. tab. 1; *Aiton, Hort. Kew.* 1. 149; *Lam. Illustr.* 1. 326. tab. 82; *Dict.* 8. 800;—radice tuberoso fusiformi; caule inferne lignoso, perenni; ramulis subherbaceis, annuis, erectis, pedalibus, pilosis, angulatis; foliis ovato-oblongis, v. ovato-lanceolatis, pilosulis, margine ciliatis, acutis, basi obtusis, petiolatis, superioribus floriferis geminis; floribus tetrameris, umbellatis, umbellis fere sessilibus, pedicellis divaricatis, petiolo unciali æquilongis, calyceque brevi 4-dentato glabris, corolla calyce 2-plo majore, tubo urceolato imo coarctato, tuberculis 4 instructo, limbo 4-lobo, rotato, lobis lanceolatis, staminibus 4, tuberculis alternis, filamentis brevibus, imo dilatatis, pilosis, antheris ovalibus, conniventibus.—America meridionalis.

This plant, known only as having been cultivated in the Botanic Garden of Kew, is described by L'Heritier and Aiton as above-quoted, but the dried specimens preserved by these botanists do not appear in the Banksian herbarium. The stem is said to be a foot high, covered with dark red pubescence; the leaves are 3 inches long, upon a petiole nearly an inch in length, and almost glabrous; the umbels are nearly as long as the petioles, the pedicels being scarcely half an inch long; the calyx is short and glabrous; the corolla of a pale yellow colour; the tube is $1\frac{1}{2}$ line in diameter, and the lobes 3 lines long. The fruit is a 2-locular berry, with numerous seeds attached to an adnate placenta projecting from each side of the dissepiment. The characters of this plant will thus be seen to be all strictly in accordance with

* This plant is shown in plate 39 A.

the genus *Saracha*, as has been noticed on a previous occasion when treating of the genus *Witheringia* (*ante*, p. 3), and the reasoning upon which this conclusion is based will be found strengthened by a comparison of L'Heritier's figure of his *Witheringia solanacea* with that of the preceding species *S. glandulosa*, to which I have just made reference.

23. *Saracha diffusa* (n. sp.);—caule angulato-striato, dichotome diffuso, subglabro vel parce puberulo; foliis late ovatis, acutis, basi obtusiusculis, repente in petiolum attenuatis, superioribus geminatis, utrinque pilis articulatis pubescentibus; floribus umbellatis, pedicellis 2–6, pedunculo elongato folio æquilongo tertio brevioribus, omnibus pilosis; calyce acutilobo, hirsuto; corolla rotata, angulato-5-loba, utrinque glabra, staminibus corollæ dimidio brevioribus; bacca pisiformi, calyce rotato aucto suffulta.—Mexico, *v. in herb. Hook.* (Oaxaca, *Galeotti, no.* 1169.)

In this plant the internodes are very distant, and the leaves, shorter than the peduncle, are $1\frac{1}{2}$ inch long by $1\frac{1}{4}$ inch broad, upon a petiole of 5 lines in length; the peduncle is 2 to $2\frac{1}{2}$ inches long, the pedicels $\frac{3}{4}$ inch in length.

Acnistus.

To this genus, as defined on a former occasion (see vol. i. p. 16 of this work), I have to add another species. Subsequently (*ibid.* p. 137) I alluded to the great proximity which this genus offers to *Dunalia*, and I may also add that it touches likewise upon the section *Chænesthes* of *Iochroma* on the one hand, in a manner that renders it difficult to determine whether one species of *Acnistus* belongs to this or to the former genus; on the other hand again it osculates closely upon *Brachistus*, so that *B. oblongifolius* from the length of its corolla (being twice that of its calyx) might almost be considered as an *Acnistus*: in this latter case however, as the plant has very dissimilar geminate leaves, a character peculiarly remarkable in most species of *Brachistus*, and as it presents only two, rarely more flowers in each axil, it cannot be considered as an *Acnistus*.

14. *Acnistus confertiflorus* (n. sp.);—ramulis glabris, striatis; foliis fasciculatis, oblongis, basi cuneatis, in petiolum longum gracilem attenuatis, apice obtusiusculis, supra pubescentibus, subtus fusco-tomentosis: floribus umbellato-fasciculatis, pedunculis apice incrassatis, calyceque pilosiusculis, corolla lutea, glabra, lobis acutis, marginibus tomentosis, staminibus styloque subexsertis.—Peruvia, *v. s. in herb. Lindley* (Lobb. n. 328).

In this species the leaves (including a petiole of $\frac{3}{4}$ inch long) are $2\frac{1}{4}$ inches in length and $\frac{3}{4}$ inch broad; the peduncle is 9 or

10 lines, the corolla 8 lines long: each axil usually presents four to five or six flowers, fasciculated with two to three or four young leaves, all growing out of the cicatrix of a fallen leaf of the previous year: it is probable therefore that the leaves grow to a much larger size than are seen in the above specimen. It comes very near *Acnistus cauliflorus*.

Dunalia.

Since the last species of this genus were described, I am glad to have had an opportunity of seeing a new and very distinct species belonging to the section *Paucifloræ*, which I found cultivated at Kew, under the name of *Lycium obovatum*. It confirms the views before taken of its structure, founded on an examination of the dried specimens described in the former volume of this work, pp. 13 and 136.

7. *Dunalia lilacina* (n. sp.);—fruticosa, inermis, ramulis striatis; foliis in axillis fasciculatis, spathulato-oblongis, apice obtusiusculis aut vix acutis, in petiolum elongatum gracilem attenuatis, utrinque glaberrimis, margine revolutis, venis superne immersis subtus coloratis; floribus in fasciculis axillaribus solitariis, nutantibus, pedunculo gracili, 1-floro, calyceque brevi campanulato 5-nervio glabro, dentibus 5, rotundatis, mucronatis; corolla infundibuliformi, lilacina, calyce 6-plo longiore, extus vix puberula, intus superne glabra, imo pubescente, limbo brevissimo, tomentoso, fere integro, dentibus 5–6, acutis, cum alteris fere obsoletis glabris interjectis; staminibus 5–6, inclusis, quorum 3 paulo brevioribus, filamentis glabris, supra basin insertis, appendicibus brevibus, utrinque bifidis, cano-pubescentibus; stylo glabro, incluso.—Patria ignota, *v. s. in hort. Kew. cult.*

This species approaches very near to *D. ramiflora*: the internodes are closely approximated, with four to six leaves crowded in each axil; the leaves are $1\frac{3}{4}$ inch long, tapering gradually from near the apex into a slender petiole of $\frac{3}{4}$ of an inch, being altogether $2\frac{1}{2}$ inches in length, and they are 5 lines in breadth; the peduncles are only $\frac{1}{2}$ inch long, scarcely thickened at the apex; the calyx is 2 lines long; the corolla 1 inch in length, 2 lines in diameter from the base to the middle, whence it gradually enlarges to nearly 4 lines in the mouth; the filaments are quite glabrous, arising from fleshy oblong cano-tomentose processes, with free margins, adnate to the base of the corolla for the length of $1\frac{1}{2}$ line; the appendages, which are a continuation of the free margins of the processes, instead of being single and glabrous on each side of the filaments, as in all the other species, are here each bifid, very cano-tomentose, and scarcely a line in

length ; the anthers are below the mouth of the corolla, as is also the clavate stigma, which is crowned with two greenish viscid glands.

Phrodus.

Among the collections made by Bridges in the arid districts of the province of Coquimbo in Chile, are three plants that bear quite the aspect of some of the singular Nolanaceous species which I noticed on a previous occasion as belonging to the genera *Alona* and *Dolium* of Dr. Lindley. One of these same plants was formerly described by me (*huj. op.* vol. i. p. 54) under the name of *Alona microphylla*, because it possessed the same general habit, with flowers similar to those of *Alona ericifolia* and other Nolanaceous plants from the same locality, and being without fruit I concluded it must belong to that genus.

The plants now to be described, though evidently referrible to the tribe *Solaneæ* of Endlicher, do not correspond with any recorded genus : from *Salpichroma* they differ in having a more tubular calyx, and a much shorter and broader corolla, which does not become black in drying : they approach *Dunalia* in the structure of their flowers, and somewhat in their Lycium-like habit, but their filaments are simple and more exserted. They greatly resemble at the same time many species of *Lycium*, but they differ from that genus in having much larger and more campanular flowers with a very different æstivation. The generic name now proposed for these plants is derived from φροῦδος, *evanidus*, because of their shabby stunted habit.

Phrodus (gen. nov.).—*Calyx* urceolato-tubulosus, usque ad medium 5-dentatus, dentibus acutis, persistens. *Corolla* infundibuliformis, tubo imo contracto, superne ampliore, limbo 5-partito, laciniis oblongis vel rotundatis, expansis, æstivatione induplicato-valvatis. *Stamina* 5, subinæqualia, longe exserta ; *filamenta* filiformia, in coarctationem tubi adnata, imo villosa, hinc glabra ; *antheræ* ovatæ, 2-lobæ, sine connectivo apicifixæ, lobis adnatis, rima laterali longitudinaliter dehiscentibus. *Ovarium* ovatum, imo glandula annulari cinctum, 2-loculare, pluriovulatum, placentis incrassatis dissepimento utrinque adnatis. *Stylus* filiformis, longitudine staminum. *Stigma* clavatum, obsolete 2-lobum. *Bacca* globosa, apice conica, calyce distensa arcte inclusa, 2-locularis, polysperma. *Semina* compressa, reniformia. *Embryo* in *albumen* carnosum teres, arcuatus, *radicula* ad angulum basilarem spectante, *cotyledonibus* semiteretibus fere æquante.—Fruticuli *Chilenses ramosissimi* ; folia *minima, ericoidea, carnosula* ; flores *solitarii, axillares, pedunculati*.

1. *Phrodus microphyllus*. Alona microphylla, *huj. op.* vol. i. p. 54 ;—fruticulosus, nodoso-flexuosus, implexo-ramosus, ra-

mulis junioribus brevibus divaricatis, vel deflexis, abortu apice sæpe spinescentibus; foliis subsessilibus parvulis, subfasciculatis, spathulato-oblongis, carnosis, superne canaliculatis, subtus convexis, utrinque glanduloso-pubescentibus, imo callo tumido persistente suffultis, callibus agglomeratis et axillis demum nudis hinc nodosis; floribus breviter pedunculatis.—Chile, prov. Coquimbo, *v. s. in herb. Hook.* (Bridges, no. 1330), *in herb. Lindl.* (Bridges, no. 1331*).

This appears to be a low bushy stunted shrub, with close, short, flexuose, knotty branchlets, frequently spinescent at the apex, or often reduced to a short spine: the older branches are generally quite bare of leaves, but the younger ones are closely invested with minute fleshy fasciculate semiterete leaves, scarcely more than 1 or 2 lines in length, and barely half a line in thickness; these soon fall off, leaving the axils bare, the sterile appearance of which is increased by the knotty accretions formed by the persistent tumid bases of the fasciculate leaves; the peduncle is 2 lines in length; the calyx, 3 lines long, is somewhat campanular, being 2 lines broad, cleft full one-third of its length into five erect equal teeth: the corolla seldom exceeds 6 or 8 lines in length, the portion within the calyx being cylindrical, but it swells above and becomes funnel-shaped, with an expanded border consisting of five obtusely triangular equal lobes; the stamens are inserted in the contracted portion of the tube, where they are very hairy, above they are quite smooth, slender, erect, and extend 2 lines beyond the mouth of the tube; the style is exserted to the same length†.

2. *Phrodus Bridgesii* (n. sp.);—fruticosus, ramulis elongatis, teneris, subadscendentibus; foliis fasciculatis, spathulato-linearibus, subcarnosis, superne canaliculatis, subtus convexis, utrinque viscoso-pubescentibus; corolla calyce 3-plo longiore; sta-

* There is evidently a confusion here in the numbers, which is not unfrequent in many of Bridges's Chile plants, in consequence of two or more specimens having been distributed on the same sheet without attached labels. Owing to this same cause, I have described his no. 1331 as the *Dolia vermiculata*; it should have been no. 1330, these numbers having been respectively interchanged. Under no. 1332 two very different plants have been distributed; in Dr. Lindley's herbarium that number corresponds with his *Alona baccata*, and in Sir Wm. Hooker's herbarium the same number refers to a very distinct plant, which I have correctly described under the name of *Sorema acuminata*. I may here also observe, that there exists another error connected with some of Bridges's plants formerly described by me, inasfar as regards their locality: thus *Sorema acuminata* (Lond. Journ. Bot. iv. 370), *Sorema linearis* (id. 499), *Alona ericifolia* (id. 501), and *Dolia clavata* (id. 508), are all from the neighbourhood of Coquimbo, and not from Concepcion, as I found inscribed in mistake on the specimens referred to.

† This plant with generic details is figured in plate 42 A.

minibus subinæqualibus, longe exsertis, stylo æquilongis.—Chile ad Coquimbo. *v. s. in herb. Hook. et Lindl.* (Bridges, no. 1332).

The habit of this species is somewhat different from the preceding, the branchlets being much longer, straighter and more slender; the leaves are also larger and more linear, being 4 lines long by $\frac{3}{4}$ line broad, and after their fall the axils do not become enlarged by callous knots, as occurs in the two other species; the peduncle is 4 lines long; the calyx, 5 lines in length, is more funnel-shaped, and divided nearly halfway down into five acute teeth; the corolla is 9 lines long, spreading above to a diameter of 6 lines, with a border of five short lobes, and is apparently of a pale yellow or whitish colour; both it and the calyx as well as the peduncle, the stem and the leaves are thickly clothed with short glandular pubescent down: the style, thickened at its apex, is considerably farther exserted than the stamens: the berry, closely invested by the calyx, is globular, with a conical apex, and is 5 lines in diameter*.

3. *Phrodus nodosus* (n. sp.);—fruticosus, ramulis nodoso-flexuosis, subadscendentibus; foliis fasciculatis, spathulato-linearibus, carnosis, eveniis, superne canaliculatis, imo callo tumido persistente suffultis, axillis hinc demum nodosis: corolla obscuriore, calyce campanulato duplo longiore, staminibus vix exsertis; stylo istis multo longiore.—Coquimbo, *v. s. in herb. Hook. et Lindl.* (Bridges, no. 1333).

The habit of this plant is intermediate between the two former, the branches being flexuose and knotty as in the first species; its leaves are similar in size and shape to those of *P. Bridgesii*, but the agglomerated persistent callous bases of the leaves, after they have fallen, give to the branches, which are more flexuose and crooked, the same knotty appearance as in *P. microphylla*, a character quite wanting in the second species †.

Physalis.

Having spoken so frequently of this genus in relation to other approximate genera, it is desirable that its limits should be defined with more accuracy than heretofore. Its distinction from *Saracha* has been already marked by its inflorescence offering always a solitary axile flower, by its greatly increased vesicular reticulated calyx in fruit wholly inclosing the berry, and by its more deeply campanular and less rotate corolla with a border not

* This species is figured in plate 41.
† This plant is shown in plate 42 B.

so deeply cleft. In its enlarged vesicular calyx it offers much analogy with the genera *Nicandra*, *Cacabus*, *Thinogeton*, *Anisodus*, *Withania* and *Hypnoticum*, but the former has a longer and larger campanular corolla, with an erect almost entire margin, and a calyx with five deeply carinated angles, and five spur-like extensions at its base; the second has a more decidedly infundibuliform corolla, resembling that of a *Nolana*, and an almost transparent calyx marked with dark green lines; the third has a still more tubular corolla with an enlarged thickened calyx: *Anisodus* has a large deeply bell-shaped flower with rounded lobes, and a vesicular thickened calyx with five large prominent nervures which become woody: in *Withania* the corolla is narrow and deeply cleft, and the fructiferous calyx is broad and not contracted in its mouth: *Hypnoticum* has a small corolla with an extremely short tube, and a small erect five-cleft border.

In *Physalis*, on the contrary, the corolla is broadly campanular, with a spreading pentangular border more or less entire, and generally with five large coloured spots at its base. All possess a swelling calyx enveloping the fruit, and *Hypnoticum* agrees with *Physalis* in having stellate or brachiate pubescence. The following is its emended generic character:—

Physalis (char. reform.).—*Calyx* brevis, tubulosus, in lobis 5 acutis semifissus, tubo in fructu valde aucto vesiculoso 5-anguloso, persistens. *Corolla* late campanulata, sæpissime maculis magnis 5 colorata, imo breviter coarctata, limbo subrotato, 5-angulato, rarius in lobis 5 triangularibus partito, æstivatione plicato-valvata. *Stamina* 5, imo corollæ inserta, e squamis 3-dentatis basi corollæ adnatis et fere in annulum sistentibus orta; *filamenta* teretia, erecta; antheræ oblongæ, basifixæ, circum stylum conniventes, loculis 2, parallele connexis, rima marginali longitudinaliter dehiscentibus. *Ovarium* ovatum, imo disco carnoso impositum, 2-loculare, *placentis* e dissepimento cruciatim partientibus, tunc bifidis, lunularibus, undique ovuligeris. *Stylus* simplex, longitudine staminum. *Stigma* capitatum, 2-lobum. *Bacca* globosa, calyce vesiculoso, membranaceo, reticulato, celata. *Semina* plurima, parva, in pulpam nidulantia, reniformia, *testa* scrobiculata. *Embryo* intra *albumen* carnosum hemicyclicus, teres, radicula infera, hilo laterali evitante, cotyledonibus semiteretibus duplo longiore.—Herbæ *suffruticulosæ, radice perennante, totius orbis undique indigenæ, procumbentes, dichotomo-ramosæ, pilosæ*; folia *alterna, vel gemina, ovata, integra, aut angulato-dentata, interdum cordata*; flores *pedunculati, solitarii, extra-axillares, sæpissime nutantes.*

All the species of *Physalis* are too well known and described

to require any observation, but for the sake of illustrating the details of the genus, I have added a species that appears to be unrecorded.

Physalis gracilis (n. sp.) ;—caule gracili, substricto, pubescente ; foliis ovatis, acutis, petiolatis, sæpe inæquilateralibus, crassiusculis, utrinque pallidis et pubescentibus, petiolo sublongo, piloso ; floribus axillaribus, subsolitariis, pedunculo gracili, petiolo æquilongo, 1-floro, flore nutante ; calyce campanulato, profunde 5-partito, lobis acutis ; corolla cyathiformi-campanulata, lutea, maculis 5 magnis violaceis notata, limbo 5-angulato, angulis obtusis ; staminibus corolla brevioribus, filamentis brevissimis.—Real del Monte, Mexico, *v. s. in herb. Hook.* (Coulter, 1222).

The specimen is scarcely more than 8 inches long, with a single, slim, straight, apparently erect and somewhat branching stem ; the internodes are about 1 inch, the leaves 12 to 15 lines long, 8 lines broad, upon a slender petiole 4 lines in length, they are somewhat obtuse and unequal at base ; the more slender peduncle is about 6–8 lines ; the calyx, 5 lines long, is half cleft into five acute segments, and together with the peduncle is hairy ; the corolla is 8 lines broad and 4 lines deep, the filaments are 3 lines, and the anthers nearly 2 lines long*.

Larnax.

There exists a small group of plants in several respects approaching *Physalis* as defined in the preceding page, but which differ in having fasciculate flowers, a corolla deeply 5-cleft, and in being herbaceous, erect, not prostrate plants. They vary from *Cacabus* and *Thinogeton* in the structure and colour of their corolla. The type is the *Physalis subtriflora* of the 'Flora Peruviana,' tab. 176, and two other plants described by Prof. Kunth are evidently congeneric with it. They differ from *Saracha* in their flowers being fasciculate, not decidedly umbellate, and in their inflated calyx, which subsequently incloses the fruit, as in *Physalis*. They approach *Margaranthus* very closely, but they do not accord with that genus in the form of their corolla. The generic name proposed for this group is derived from λάρναξ, *capsa*, because the fruit is encased by the swollen calyx.

Larnax (gen. nov.).—*Calyx* tubulosus, angulatus, tenuis, 5-dentatus, demum augescens et vesicarius. *Corolla* tubo brevissimo, campanulato-infundibuliformi, limbo 5-fido, lobis acutis, subpatentibus. *Stamina* 5, brevia, tubo inclusa, æqualia, *fila-*

* A figure of this species is given in plate 39 B.

menta brevissima, *antheræ* 2-loculares, loculis adnatis. *Ovarium* ovatum, 2-loculare. *Stylus* brevis, erectus, apice subincurvus. *Stigma* sub-2-lobum. *Bacca* pisiformis, 2-locularis, calyce globoso, urceolato, vesicario, membranaceo inclusa. *Semina* plurima, reniformia. *Embryo* ignotus.—Herbæ Peruvianæ et Mexicanæ, *annuæ, erectæ, dichotome ramosæ*; folia *alterna, solitaria aut gemina, petiolata*; flores *axillares, subsolitarii, aut plurimi fasciculati*; pedunculi 1-*flori, floriferi erecti, fructiferi cernui*; corolla *lutea*.

1. *Larnax subtriflora*. Physalis subtriflora, *R. et P. Flora Peruv.* ii. 42. tab. 176 *a*;—caule angulato; foliis ovatis, acutis, solitariis, vel geminis, venosis, utrinque villosis, pilis mollibus articulatis; pedunculis 2–3nisve, gracilibus, erectiusculis; corolla lutea, venosa; bacca pisiformi, lutescente.—Peruvia, ad Obragillo.

This is an annual, growing to the height of 2 feet; the leaves are represented as being 3 inches long, $1\frac{1}{2}$ broad, on a petiole of 4 or 5 lines, they are somewhat unequal at base, and covered with long soft pubescence; the peduncles are from 6 to 9 lines long, the calyx scarcely 2 lines in length, the tube of the corolla 2 lines long, campanulate above, and the lobes of the border, of the same length, are somewhat patent.

2. *Larnax Orinocensis*. Physalis Orinocensis, *H. B. K.* iii. 12;—caule herbaceo angulato, dichotome ramoso; foliis ovatis, subacuminatis, basi inæqualibus, et in petiolum decurrentibus, supra glabris, subtus pallidioribus, nervo venisque hirtellis; floribus geminis, pedunculatis, pendulis; calyce urceolato-globoso, piloso, 5-dentato, dentibus acutis, pilis articulatis; corolla infundibuliformi-campanulata, pilosiuscula, limbo 5-fido, laciniis obtusis æqualibus; bacca globosa, pisiformi, calyce vesicario aucto reticulato tecta.—Orinoco.

Neither this plant nor the following, from their inflorescence or general appearance, accord with *Physalis*, and so much was Prof. Kunth impressed with this idea, that he adds respecting them, "species anomalæ, an genus distinctum?" They appear to agree in all essential respects with the characters of the plant last described. The leaves are from 3 to $3\frac{1}{2}$ inches long, 19 to 20 lines broad, on a pubescent petiole of 8 to 10 lines in length. The flowers are 5 lines long; the peduncles 2 lines in flower, 4 lines in fruit. The stamens are included within the corolla and are glabrous.

3. *Larnax Xalapensis*. Physalis Xalapensis, *H. B. K. loc. cit.* p. 13;—caule herbaceo, angulato, subdichotome ramoso; foliis oblongis, acuminatis, basi angustatis et æqualibus, integris,

ciliatis, pilis minutissimis utrinque conspersis; floribus plurimis, subfasciculatis, pedunculis pilosis, calyce, corolla, fructuque ut in præcedente.—Mexico, ad Xalapam.

This species differs only from the former in its more acuminate leaves, equal at base and pilose on both sides, and in its fasciculate flowers. The leaves are from 4 to 5 inches long, 20 to 21 lines broad, on a petiole of 12 to 15 lines in length. The flowers resemble those of the former species in size and shape; they are probably fasciculate, as in the first-mentioned species, and not umbellate, a mode of expression often used by Professor Kunth in that sense, which is the more evident, as he makes no allusion to any general peduncle.

Margaranthus.

Among the various collections of Mexican and South American plants, I have not been able to find any specimen corresponding with this genus, of which indeed nothing appears to be known, except the description given of it by Prof. Schlechtendal, and the figure drawn by that able botanist from living specimens raised in Halle from seeds received from Mexico. On comparing this with *Physalis* and its allied genera, it will be seen to differ from them in the smaller size and pale blue colour of its flowers, and particularly in the great contraction of the mouth of the corolla, which gives it a globular instead of a campanular form. The calyx is more entire on its margin, and like *Physalis* enlarges, becomes vesicular, and incloses a small globular berry with aqueous juice, which becomes exsuccous. I have here amended its character as contrasted with its allied genera.

Margaranthus, Schl.—*Calyx* urceolato-tubulosus, 5-angularis breviter 5-dentatus, persistens et accrescens. *Corolla* urceolato-globosa, 5-sulcata, imo attenuata, medio ventricosa, ore valde contracta, margine dentibus 5 minutis instructa, intus villosula. *Stamina* 5, æqualia, inclusa, corollæ dimidio breviora; *antheræ* conniventes, 2-lobæ, dorso affixæ, rima duplici longitudinaliter dehiscentes. *Ovarium* globosum, 2-sulcatum, disco carnoso annulari basi immersum, 2-loculare, placentis multiovulatis, medio dissepimenti utrinque adnatis. *Stylus* simplex, apice attenuatus. *Stigma* truncatum. *Bacca* substipitata, 2-locularis, exsucca, pericarpio membranaceo, polysperma, calyce inflato, ovoideo, reticulato-venoso, dentibus ore clauso laxe inclusa. *Semina* orbiculato-reniformia. *Embryo* in *albumen* semipellucidum curvatus.—Herba Mexicana *dichotome ramosa*, foliis *alternis, ovatis, vel ovato-lanceolatis, acutis, petiolatis*; floribus *axillaribus, solitariis, parvulis, pedunculatis, nutantibus, sordide cærulescentibus*.

1. *Margaranthus solanaceus*, Schl. (Hort. Halens. i. tab. 1);—valde ramosa, foliis inferioribus obovatis, acutis, imo rotundatis, obsolete dentatis, utrinque fere glabris, venis subpilosis, margineque ciliolatis, superioribus lanceolatis, petiolo canaliculato sparse pubescente.—Mexico (Papantla, *Schiede*).

This plant appears to have very much the habit of a *Physalis*; its lower leaves are 4 inches long, $2\frac{1}{2}$ inches broad, on a petiole of $\frac{1}{2}$ to $\frac{3}{4}$ inch; the upper leaves are $2\frac{1}{4}$ inches long, 10 lines broad, on a petiole of half an inch; the peduncles are 1 line long; the calyx 1 line, and the corolla 2 to $2\frac{1}{2}$ lines in diameter; the calyx increases to the size of half an inch, is globular in form, reticulate, and incloses a berry of 3 lines in diameter.

Nectouxia.

This genus appears to have been little known hitherto except from the details given by Prof. Kunth (Nov. Gen. iii. p. 10), where a figure of *Nectouxia formosa* is given in plate 193 of that work. On comparing a specimen of this genus in the herbarium of Sir Wm. Hooker, I am led to conclude it to be a second species, as I can hardly imagine that so accurate an observer could have been mistaken. In this species the difference lies in the calycine segments being much narrower, in the greater length of the corolla, in the segments of the border being narrower, in the lower insertion of the stamens, in the longer and more linear anthers, and more especially in the singular expansion of the upper portion of the filament, and finally in the exsertion of the style. Kunth describes his plant as being herbaceous and not higher than 8 inches, whereas this appears to be a much taller plant. *Nectouxia* evidently approaches very closely to the genus *Salpichroma*, and were it not for the remarkable peculiarity of the prominent corona in the mouth of the corolla, it could hardly be distinguished from that genus. Like *Salpichroma* it possesses the character of its flowers becoming black in drying: the expansion of its filament is also another distinguishing feature. I have not been able to examine its perfect fruit, but it is evidently a berry: the form and structure of its ovarium quite correspond with that of *Salpichroma*. The following is its amended character:—

Nectouxia. Char. emend.—*Calyx* 5-partitus, laciniis æqualibus, erectis, linearibus, acutis, persistens. *Corolla* hypocrateriformi-tubulosa, tubo 5-nervi, 5-angulato, superne paulo ampliato, calyce 2-plo longiore, limbo patente, 5-partito, laciniis æqualibus, oblongis, acuminato-obtusiusculis, æstivatione induplicato-valvatis, fauce in coronam brevem urceolatam exsertam 10-nervem 10-dentatam producta. *Stamina* 5, inclusa,

æqualia: *filamenta* brevia, supra tubi medium inserta, compressa, sæpe (an semper?) superne in laminam membranaceam panduræformem apice acutam subito dilatata: *antheræ* linearioblongæ, erectæ, mucronulatæ, medio dorsi affixæ, 2-loculares, loculis parallelis, usque ad medium disjunctis, rima longitudinali antice dehiscentibus. *Ovarium* conicum, disco parvo carnoso impositum, 2-locularis, placentis dissepimento utrinque adnatis, multiovulatis. *Stylus* filiformis, tubo corollæ excedens. *Stigma* exsertum clavatum emarginato-2-lobum. Cetera ignota.—Herbæ *perennes* Mexicanæ *fœtidæ*; folia *petiolata sparsa, superiores subgemina, cordata, integra.* Flores *solitarii, extra-axillares, pedunculati, cernui.* Corolla *flava, siccatione nigrescens.*

1. *Nectouxia formosa*, H. B. K. iii. 10. tab. 193;—herbacea, caule angulato; foliis cordatis, ovatis, acutis, hirtellis; calyce piloso-hispido, corolla flava, staminibus tubo haud superantibus.—Mexico (Real del Monte).

This plant is described as being scarcely 8 inches in height with a fusiform root: its leaves, sometimes geminate, are from $1\frac{1}{2}$ to $1\frac{3}{4}$ inch long, and 1 to $1\frac{1}{4}$ inch broad, upon a petiole 9 to 10 lines in length: the peduncle of its solitary axile flower is half an inch long, its calycine segments 6 lines, the tube of its corolla 10 lines, the lobes of its border 7 lines and $3\frac{1}{2}$ lines broad.

2. *Nectouxia bella* (n. sp.);—herbacea, caule striato; foliis cordatis, ovatis, acutis, utrinque sparse et mollissime pubescentibus; flore cernuo, staminibus infra faucem corollæ omnino inclusis, filamentis superne in ligulam latam membranaceam expansis.—Mexico (Real del Monte, *Coulter, no.* 1270;—circa Tolucam, *Andrieux, no.* 180).

Although found near the same locality, and in no way differing in the shape of its leaves, its herbaceous stem and tapering root, this plant offers many points of structure at variance with the foregoing species, if we depend upon the usually accurate descriptions of Prof. Kunth. It is double its height, and its leaves are proportionally larger, being often geminate, $2\frac{3}{4}$ inches long, 2 inches broad, upon a petiole $\frac{3}{4}$ inch in length; the peduncle of its axillary flower is 1 inch long, its narrow linear acute calycine segments are $\frac{1}{2}$ to $\frac{3}{4}$ inch, the tube of its corolla 1 inch to $1\frac{1}{4}$ inch in length, and 2 to 3 lines in diameter at the mouth; the lobes of its border are lanceolate, oblong, very patent, and $\frac{3}{4}$ inch long; the corona, with ten obsolete teeth, protrudes 2 lines beyond the throat; the stamens, inserted somewhat above the middle of the tube, are 3 lines long; the ovarium is elongated and pointedly conical, 3 lines long, $\frac{3}{4}$ line at base, and is seated on a pro-

minent annular ring, and the style and stigma do not exceed the extremity of the corona*.

Nicandra.

This genus of Adanson, on account of its augescent vesicular calyx, has been placed near *Physalis*, but it exhibits much dissimilarity in its habit, in the blue colour and æstivation of its large bell-shaped flowers, and in the structure of its fruit. There is only one recorded species, well known to our gardens, the old *Atropa physaloides*, Linn., which is manifestly related to *Atropa* and *Anisodus* on account of the form and imbricate æstivation of its corolla and the nature of its fruit; it differs however from both these genera in the very peculiar character of its calyx, in which respect it approaches *Juanulloa*, but it does not correspond with that genus either in its habit, the structure of its corolla, or the form of its embryo. It therefore takes its position in the tribe *Atropeæ* (*huj. op.* vol. i. p. 166), and I annex an emended character in conformity with my own observations made upon the living plant.

Nicandra, Adans. Char. emend.—*Calyx* magnus, 5-partitus, laciniis sagittato-cordatis, acutis, erectis, longitudinaliter replicatis, marginibus infra medium valvatim conniventibus, hinc pseudo-alatis, angulis basalibus in calcaria 5 uncinata acutissima productis, persistens et augescens. *Corolla* magna, campanulata, limbo brevi 5-partito, lobis latis, rotundatis, patenti-reflexis, æstivatione imbricata. *Stamina* 5, æqualia, erecta, corolla triplo breviora, *filamenta* basi tubi e glandulis totidem trigonis utrinque auriculatis lanato-tomentosis orta, hinc fornicata, erecta, et incurvata; *antheræ* ovatæ, 2-loculares, imo cordatæ, in sinu apicifixæ, loculis parallele connatis, rima marginali longitudinaliter dehiscentibus. *Ovarium* obovatum, disco carnoso crenulato insidens, 5-loculare, ovulis plurimis, placentis incrassatis axi adnatis. *Stylus* brevis, longitudine staminum. *Stigma* quinquelobum, lobis obtusis, glandulosopapillosis, in capitulum aggregatis. *Bacca* subsicca, sphærica, calyce globoso, membranaceo, valde reticulato, aucto, 5-gono inclusa, 3–5-locularis, pericarpio tenuissimo fragili irregulariter rumpente. *Semina* plurima, reniformia, *hilo* in sinu laterali; *testa* scrobiculato-favosa. *Embryo* teres, intra *albumen* carnosum spiraliter arcuatus, *cotyledonibus* semiteretibus, *radicula* angulo basali spectante, hiloque evitante, duplo brevioribus.—Herba *suffrutescens Peruana*, caulibus *plurimis, ramosis, deciduis*; foliis *alternis, superioribus geminis, oblongis, acutis, sinuato-incisis, in* petiolum *longum decurrentibus, glaberrimis*; flori-

* A representation of this species, with sectional details, is given in plate 40.

bus *pedunculatis, solitariis, extra-axillaribus, cernuis,* pedunculo *fructifero elongato, erecto, apice recurvo.*

1. *Nicandra physaloides,* Gaertn. ii. 237. tab. 131; Bot. Mag. 2458. Atropa physaloides, *Linn.*; *Jacq. Obs.* iv. tab. 98. Physalis daturæfolia, *Lam. Ency.* ii. 102. Calydermos erosus, *R. & P.* ii. 44. Alkekengi, *Feuillé, Obs.* 724. tab. 16.—Planta omnino glabra, radice fibrosa, perennante; caulibus frondosis, ramosissimis, annuis; foliis glabris, oblongis, acutis, sinuato-incisis, in petiolum longum decurrentibus; calyce reticulato, nitido, aucto; corolla magna, azurea, campanulata, fundo albido, maculis 5 obscure cæruleis notata.—Peruvia, *v. v.*

This plant is well known in most tropical countries, where it has become almost indigenous; it is cultivated in the open air in Kew Gardens, from which source an ample opportunity has been afforded of examining its structure in a living state. It grows there to the height of about 5 feet; in warmer climates it attains a height of 6 or 8 feet; its leaves are oblong, irregularly inciso-sinuate on the margin, with an acute summit, cuneate at base, and decurrent on the channeled petiole; they are about $6\frac{1}{2}$ inches long, upon a petiole of $1\frac{1}{2}$ inch, are about 4 inches broad, and quite glabrous. The peduncle is pendent, about $\frac{3}{4}$ inch in flower, growing to a length of $1\frac{1}{2}$ inch in fruit, when it becomes erect and suddenly deflexed at its thickened apex: the calyx is 9 lines long from its base to the point of its segments, or 1 inch long including its basal lobes; the segments are erect, with their margins undulated and connivent with the adjoining ones for their lower half, salient, producing the appearance as if it were 5-winged; in fruit it preserves the same form, becoming almost globular and vesicular, and of very reticulated texture, with the points of its segments conniving and wholly concealing the berry. The corolla is about twice the length of the calyx, broadly campanular, swelling gradually upwards from its middle; the lobes of the border are rounded, somewhat erect and overlapping each other at the base, and suddenly revolute towards their apex, which is very obtuse, with a slight emarginature on each side of a short central point; the stamens are scarcely one-third of the length of the corolla, arising from as many glands adnate to the base of the tube, forming a kind of fornix about the ovarium, and clothed with densely woolly brachiate hairs; the filaments above are quite smooth, erect, and incurved at the apex; the style is short, erect, surmounted by a large, globular, woolly or papillose stigma, composed of five segments closely connivent; the ovarium is seated upon a small crenulated yellow gland. The berry is quite globular, about 8 lines in diameter, with three to five cells of unequal size, having slender dissepiments, and being filled with an aqueous

juice and numerous seeds attached to a large central placentation; the berry when fully ripe becomes dry with its pericarp of thin and brittle texture, being easily ruptured by an irregular laceration. The seeds are flattened, reniform and rounded, about 1 line in diameter*.

Cliocarpus.

Among Gardner's Brazilian plants I have noticed one, which in the shape of its calyx, in the structure of its fruit, and especially in the form of its embryo, comes near *Nicandra*, but it disagrees in having a woody stem and a wholly different habit; its calyx does not, as in *Nicandra*, become thin, membranaceous and reticular, but is thick, somewhat fleshy, and densely covered with stellate tomentum, approaching in its form more to that of *Juanulloa*, although the shape of its embryo is that of the former genus. Its flower is yet unknown, as the only specimens collected were in fruit. On account of the structure of its seed I have placed it for the present next *Nicandra*, but its exact position cannot be known until we are acquainted with its floral characters. I have called the genus *Cliocarpus* from *κλείω, claudo*, *καρπὸς, fructus*, on account of its fruit being wholly concealed within the enlarged enveloping calyx. The following may be taken for its generic character until more ample details can be obtained:—

Cliocarpus (gen. nov.). Flos ignotus.—*Calyx* fructifer auctus, 5-partitus, laciniis lanceolatis, acutis, longitudinaliter subreplicatis, marginibus valvatim conniventibus, hinc tubum ventricosum sinuoso-5-angulatum, ore 5-dentato fere clausum, simulantibus, angulis imo saccatis. *Bacca* omnino inclusa, globosa, 2-locularis. *Semina* plurima, placentis dissepimento adnatis affixa, reniformia, compressa; *testa* scrobiculata, hilo in sinu laterali. *Embryo* teres, in *albumen* carnosum spiraliter arcuatus, *cotyledonibus* semiteretibus, *radicula* angulo basali spectante, hilo evitante, sub-3-plo brevioribus.—Frutex *Brasiliensis, dense stellato-tomentosus*; foliis *alternis, oblongis, integris, breviter petiolatis*; floribus *extra-axillaribus, binis vel solitariis*, pedunculo *fructifero cernuo*.

1. *Cliocarpus Gardneri* (n. sp.);—foliis obovatis, acuminatis, basi obtuse rotundatis, crassiusculis, supra pubescentibus, subtus dense cano-tomentosis, pilis stipitato-stellatis.—Brasilia, ad Arraial das Mercês, Prov. Minas Geraës, *v. s. in herb. Hook.* (*Gardner*, 5042).

This is described as a shrub 6 to 10 feet high; its branches are woody and covered with yellowish tomentum; the leaves are

* This plant with elementary details is shown in plate 43.

oblong, acuminated gradually, and sharply attenuated at the apex, rounded or subtruncated, and somewhat inæquilateral at base, 3 inches long, $1\frac{5}{8}$ inch broad, upon a thick short petiole of 2 lines in length. The flowers, sometimes in pairs, grow laterally at the base of the petiole; the peduncle is refracted, $\frac{3}{4}$ to 1 inch long, and covered with long glandular hairs mixed with shorter stellate pubescence; the calyx, also tomentose, is 8 lines long, 6 lines across, inclosing a small globular berry 4 lines in diameter*.

Marckea.

Of this genus no further information has hitherto been recorded beyond the short account first published by Richard, and so little has its affinity been understood, that it was considered by Endlicher as related to the *Nicotianeæ*. Its alliance however is evidently with *Solandra* and *Juanulloa*, agreeing with the latter genus in the structure of its calyx and fruit, and differing in the hypocrateriform shape of its corolla, with broad, expanded and almost rotate border, and in its scarlet colour.

From a plant in Sir William Hooker's herbarium, with only a single flower and fruit, I have been able to make the following analysis, which in some respects is incomplete, as I was anxious not to injure the specimen.

Marckea, *L. C. Richard.* Lamarckea, *Pers.*—*Calyx* 5-sepalus, persistens, vix augescens: *sepala* lanceolata, acuminatissima, imo angustata, primum ultra medium, marginibus ciliatis, in tubum pentagonum valvatim conniventia, hinc superne linearia-attenuata, erecta, libera, dein in fructu omnino sejuncta. *Corolla* hypocrateriformis, tubo elongato, cylindrico, fauce subinflato, limbo 5-partito, laciniis oblongis, rotundatis, rotato-expansis, subreflexis, æstivatione imbricata. *Stamina* 5, æqualia, paulo supra basin corollæ orta, basi lanata, *filamenta* erecta, tenuia, *antheræ* in faucem corollæ inclusæ, 2-loculares, linearia-oblongæ, lobis disjunctis, puncto medio affixis, rima marginali longitudinaliter dehiscentibus. *Ovarium* 2-loculare, placentis e dissepimento utrinque cruciatim tenuiter partientibus, hinc incrassatis undique ovuligeris, ovulis angulo basali nexis, adscendentibus. *Stylus* tenuis, longitudine staminum. *Stigma* integrum? *Bacca* fere capsularis, exsucca, evalvis, pericarpio tenui indehiscente, sepalis persistentibus tecta, oblonga, 2-sulcata, 2-locularis. *Semina* plurima, imbricatim disposita, oblonga, acuminata, imo gibba, hilo in angulo basali, adscendentia, testa laxa. *Embryo* intra albumen parcum, carnosum, axillaris, leviter arcuatus, radicula infera tereti, cotyledonibus ovatis, compressis, incumbentibus, æquilonga.—Suffrutices

* This plant is seen in plate 44.

Guianenses et Antillani scandentes, ramis *dependentibus*; folia *alterna, petiolata, elliptica, acuta, integra, glabra*; racemi *axillares*; corolla *coccinea.*

1. *Marckea coccinea,* L. C. Rich. *Act. Soc. Hist. Nat. Par.* 107; A. Rich. *Dict. Class.* x. 168. *cum icone.* Lamarckea coccinea, *Pers. Ench.* i. 218;—scandens, glaberrima; foliis oblongis, apice subito acuminatis, imo obtusis, nitidis, subcoriaceis; racemo longe pedunculato, paucifloro, corolla coccinea, calyce 2–3-plove longiore.—Guiana, *v. s. in herb. Hook.* (Surinam, *Hostman, no.* 348).

This is evidently a scandent plant with slender branches; the leaves are about $7\frac{1}{2}$ inches long, $2\frac{3}{4}$ inches broad, upon a somewhat slender petiole, somewhat thickened at base, $\frac{1}{2}$ inch in length; they are quite smooth and of thick texture; the peduncle of the raceme is axillary, about $3\frac{1}{2}$ inches long, bearing a few flowers, only one remaining in the specimen above referred to; the pedicel is about 1 inch in length; the sepals are $1\frac{1}{4}$ inch long, scarcely 3 lines broad in the middle; the tube of the corolla is $1\frac{3}{4}$ inch long, 2 lines in diameter, swelling to half an inch below the mouth; the lobes are 5 lines long, 4 lines broad, rounded, veined, overlapping each other on their margins, and when expanded, form a border about $1\frac{1}{4}$ inch in diameter; the insertion of the stamens is about half an inch above the base of the tube, the filaments are very slender, nearly an inch long, and the anthers are 3 lines in length; the berry is 8 lines long, 4 lines in diameter, apparently quite free of pulp, with a thin pericarp and slender dissepiment, containing numerous divaricate, ascending, imbricate seeds, each about $1\frac{1}{2}$ line in length*.

2. *Marckea*? *longiflora* (n. sp.);—scandens, ramulis glabris compressis; foliis alternis, oblongis, apice repente acuminulatis, e medio ad basin subattenuatis, breviter petiolatis, coriaceis, glaberrimis, opacis; racemo sub-brevi, paucifloro; corolla calyce 4–5-plo longiore, tubo supra medium cylindraceo-campanulato, limbi laciniis ovatis, subreflexis, staminibus inclusis.—Trinidad, *v. s. in herb. Hook.* (La Laguna de Ora pouche, *Purdie.*)

This plant corresponds in its habit with *Marckea,* but the specimen above referred to presents only a single flower in a very bad condition, so that it is impossible to determine with certainty whether or not it belongs to this genus. The leaves are $7\frac{1}{4}$ inches long, $3\frac{3}{4}$ inches broad, on a somewhat slender petiole thickened at base, and half an inch in length; they are quite coriaceous, opake but not polished, though entirely glabrous; they are marked with strong prominent nerves; the peduncle of the raceme is appa-

* A representation of this plant, with sectional details, is given in plate 15.

rently about $1\frac{1}{2}$ inch long, the pedicel 8 lines; the calyx exactly corresponds with that of the preceding species, the sepals being nearly an inch long, including their suddenly contracted linear apical points of 3 lines; they are about 4 lines broad, with nearly parallel margins, which are slightly connivent; the tube of the corolla is about 3 inches in length, contracted at base for the length of $1\frac{1}{4}$ inch to scarcely more than $1\frac{1}{2}$ line broad, and swelling above to a diameter of half an inch; the lobes of the border are about half an inch in length and 4 or 5 lines in breadth, somewhat obtuse and patent; the stamens appear to originate in the contraction of the tube, with the anthers considerably below the mouth of the border; the corolla is of much thinner texture than that of *M. coccinea*: in the form of its berry and enveloping calyx, the arrangement, size, and shape of its seeds, its lax testa, very thin albumen, and form of its embryo, it quite agrees with the former species.

Juanulloa.

This little-known genus of the 'Flora Peruviana' was scarcely understood by the botanists of our time, until the very interesting account and excellent figure of a plant raised from seed in the Botanic Gardens of Kew was lately published by Sir Wm. Hooker. This proves to be a very different species from that figured by Ruiz and Pavon, and although generically identical with the *Laureria mexicana* of Schlechtendal, is again specifically distinct from it. The genus approaches *Solandra* in its climbing habit, large coriaceous leaves, and in the general structure of its flower and fruit, agreeing with it also in having a calyx consisting of five distinct sepals, conniving by their edges into an acutely pentangular tube, but here they subsequently become quite separate; it is also dissimilar in the cylindrical form of its corolla, with a small border of five rounded patent lobes, and with included stamens. It likewise approaches *Marckea* in the structure of its calyx, in which respect it resembles *Nicandra* and *Cliocarpus*, with which latter genus it also agrees, in having stellate tomentum. I have been able to complete from different sources the following amended generic character:—

Juanulloa, R. & P. *Prodr.* xxvii. tab. 4. Ulloa, *Pers. Ench.* i. 218. Laureria, *Schlecht. Linn.* viii. 513. Brugmansia, *Sp. hortul.*—*Calyx* coloratus, 5-sepalus, sepalis oblongo-acutis, marginibus subreflexis undulatis valvatim conniventibus, tubum inflatum 5-angularem ore coarctatum et 5-dentatum simulantibus, dein liberis et persistentibus. *Corolla* cylindrico-tubulosa, medio inflata, carnosula, fauce coarctata, limbo 5-lobo, lobis brevissimis, rotundatis, patentibus, æstivatione imbricata. *Stamina* 5, æqualia, inclusa, erecta, *filamenta* in coarctationem

imam corollæ inserta, basi villosa, *antheræ* sublineares, 2-lobæ, lobis parallelis, connectivo lineari dorsali adnatis, intus longitudinaliter dehiscentibus. *Ovarium* conicum, disco carnoso 5-lobo impositum, 2-loculare, multiovulatum, placentis centralibus incrassatis dissepimento utrinque adnatis. *Stylus* inclusus, apice crassescens. *Stigma* oblongum, sub-bilabiatum, lobis carnosis, adpressis, intus glandulosis. *Bacca* ovata, sepalis sejunctis cincta, 2-locularis. Semina plurima in pulpam nidulantia, oblonga, vix reniformia, compressa, hilo infra medium laterali. *Embryo* intra *albumen* carnosum, fere rectus, *radicula* infera, tereti, paulo incurvata, *cotyledonibus* oblongis, crassis, compressis, accumbentibus, rectis, duplo longiore.—Suffrutices *Peruviani et Mexicani dependentes*; folia *alterna, oblonga, integra, coriacea, pube tomentosa stellata plus minusve induta*; racemi *terminales penduli*; flores *aurantiaci, vel punicei.*

1. *Juanulloa parasitica*, R. & P. Fl. Peruv. ii. 47. tab. 185. Ulloa parasitica, *Pers. Ench.* i. 218;—suffrutex epiphytica, ramulis junioribus angulatis, glabris, epidermide tenui rimosa; foliis oblongis, acuminatis, coriaceis, nitidis, ruguloso-punctulatis, subtus albido vel flavido-furfuraceis, petiolo canaliculato, tenui, limbo 4–6-plo breviore; racemis terminalibus, pendulis, dichotome ramosis; calyce magno, ovato, carnoso, colorato, inflato, 5-angulato, laciniis demum sejunctis; corolla punicea, cylindrica, calyce paulo longiore, medio subinflata, fauce coarctata, lobis brevibus rotundatis, patentibus; bacca cerasi magnitudine punicea, sepalis erectis vestita.—In Andibus Peruvianis excelsis, Pozuzo, Prov. Tarmæ, *v. s. in herb. Mus. Brit.* (Pavon).

The leaves in this species are $5\frac{1}{2}$ inches long, $2\frac{1}{2}$ inches broad, with a thick channeled petiole of $\frac{3}{4}$ inch in length; the raceme is paniculate, 4–5 inches long, the pedicels $\frac{1}{2}$ inch; the calyx, almost glabrous, is $1\frac{1}{2}$ inch long, and $\frac{3}{4}$ inch diameter; the corolla is $1\frac{3}{4}$ inch long, 4 lines in diameter in the middle, 3 lines at both extremities, the lobes of the border being scarcely 2 lines in size; the filaments are 5 lines long, the anthers of equal length, the berry being 1 inch long and $\frac{3}{4}$ inch in diameter.

2. *Juanulloa Mexicana.* Laureria Mexicana, *Schlecht. Linn.* viii. 513. Brugmansia floribunda?, *Paxton, Mag. Bot.* ix. 241. *cum icone*;—frutex orgyalis, ramis glabris, epidermide rimosa, junioribus fulvido-tomentosis; foliis ovatis, v. lato-lanceolatis, utrinque breviter acutis, supra lævibus, subtus præsertim in nervis tomento molli stellato tectis, breviter petiolatis; calyce magno, e sepalis 5, lato-ovatis, imo anguste attenuatis, tertia parte infima in tubum 5-gonum 5-alatum margine cohærentibus, demum sejunctis; corolla calyce paulo longiore, tubu-

losa, sub-5-gona, extus stellato-tomentosa, intus glabra, carnosa, limbi laciniis brevibus, obtusis: staminibus imo tomentosis, inclusis.—Mexico, La Laguna (*Schiede*); *v. s. in herb. Hook.* (Tenampa, Prov. Vera Cruz, *Linden, no.* 50).

The leaves of this plant are described by Schlechtendal as being from 4 to 6 inches long and from 2 to 3 inches broad, upon a very short petiole of only 3 or 6 lines in length; the calyx is $1\frac{1}{4}$ inch long, increasing to $1\frac{1}{2}$ inch; the corolla is $1\frac{1}{2}$ inch long, the filaments being 9 lines and the anthers 5 lines in length.

Linden's plant above quoted, I have presumed to be the same species: here the leaves are thick and coriaceous, quite smooth above, clothed below with yellowish stellate down; they are broadly ovate, shortly and suddenly attenuated at the obtuse emarginated apex, $5\frac{1}{2}$ inches long, $3\frac{1}{2}$ inches broad, on a thick channeled petiole of $\frac{5}{8}$ to $\frac{3}{4}$ inch in length; the inflorescence is much longer than in any other species, each dichotomous branch forming a distinct raceme of $4\frac{1}{2}$ inches in length, bearing the articulations of several flowers towards their apex, which have all fallen off.

3. *Juanulloa Hookeriana.* Juanulloa parasitica, *Hook. Bot. Mag.* tab. 4118;—frutex subscandens, ramis glabris, incano-glaucis epidermide rimosa, junioribus argenteo-tomentosis: foliis elliptico-oblongis, utrinque subattenuatis, subcoriaceis, supra lævibus, subtus alutaceo-pulverulentis, pilis stellatis subtomentosis, petiolo glabro, subtenui, canaliculato; racemo brevi, subpaniculato, terminali, pedicellis brevissimis, crassis; calyce magno, inflato, 5-angulato, breviter 5-dentato, angulis mox alatis et undulatis, e sepalis lineari-lanceolatis, 3-nerviis, crassocoriaceis, aurantiaco-pulverulentis, margine cohærentibus, demum liberis et persistentibus; corolla cylindracea, imo breviter coarctata, calyce tertio longiore, limbi laciniis ovatis, obtusis, patentibus; antheris infra faucem arcte conniventibus.—Patria ignota; *v. v. cult. in hort. Kew.*

The leaves of this species are $5\frac{1}{2}$ inches long, $2\frac{1}{2}$ inches broad, on a petiole of $\frac{1}{2}$ to $\frac{3}{4}$ inch in length; the terminal inflorescence branches into two or three very short few-flowered racemes, the pedicels being 2 lines in length; the thick fleshy sepals are of an orange colour, $1\frac{1}{4}$ to $1\frac{3}{8}$ inch long, $\frac{3}{8}$ inch broad, forming by their connivent edges a long and somewhat ventricose pentangular tube, the angles appearing in some degree winged and undulating; the tube of the corolla is $1\frac{3}{4}$ inch long, 4 lines in diameter, very thick and fleshy, of a deep orange colour, externally clothed with fine floccose down, and smooth within, the segments of the border being rounded, barely 3 lines long, and $2\frac{1}{2}$ lines broad; the stamens are fixed in the contracted portion of the tube, 3 lines above the base, and are pilose at their origin, quite smooth and

terete above, erect, 11 lines long; the anthers, with somewhat mucronate apex, are 4 lines long, 1 line broad, adnate to a linear dorsal connective continuous with the filament; the ovarium is conical, seated upon a thick fleshy five-lobed gland, with emarginated rounded lobes; the style is erect, smooth, thickened and hollow towards the summit; the stigma consists of two oblong, adpressed, semiterete fleshy lobes, lined inside with green viscous glands.

4. *Juanulloa Panamensis* (n. sp.);—frutex subscandens, ramis glabris, anguloso-compressis, epidermide rimosa; foliis elliptico-oblongis, utrinque attenuatis, coriaceis, supra lævibus, subtus alutaceo-pulverulentis, pilis stellatis flavidis tomentosis, petiolo glabro, subtenui, canaliculato; racemis brevissimis, 3–4, terminalibus, aggregatis, floribus sub-umbellatim confertis: pedicellis calyce fere æquilongis, demum in fructu apice incrassatis duplo longioribus; calyce breviore pseudo-angulato, sepalis demum liberis, lanceolatis, acutis, basi latis, carnosis, aurantiaco-pulverulentis; corolla cylindracea, imo oreque coarctata, supra medium inflata, calyce fere 3-plo longiore, nervis 5 prominentibus, limbi laciniis brevissimis, obtusiusculis, staminibus inclusis; bacca oblonga, stylo persistente apiculata, sepalis coriaceis sejunctis cincta.—Panama, *v. s. in herb. Hook.* Veraguas (*Seemann, no.* 1200).

This species bears much resemblance in the form and size of its leaves to *J. Hookeriana*, but its inflorescence is very different, its calyx not half the size, the sepals less acuminate, the corolla longer and more contracted in its lower half. The leaves are 5 inches long, $2\frac{1}{2}$ inches broad, on a petiole $\frac{1}{2}$ to $\frac{3}{4}$ inch in length; they have a silvery lustre beneath, although covered somewhat more sparsely with yellow stellate or rather brachiate tomentum. The racemes, almost fasciculate at the apex of the branch, are scarcely more than $\frac{3}{8}$ of an inch in length; the pedicels are $\frac{1}{2}$ inch long in flower, 1 inch long in fruit; the sepals are little more than $\frac{5}{8}$ inch long and $\frac{3}{8}$ inch broad at base, and do not increase in size, but remain erect, separated, coriaceous, and embracing the ovate berry, $\frac{3}{4}$ inch long, $\frac{5}{8}$ inch diameter, crowned by the long, slender, persistent style; the seeds are 2 lines long, nearly a line in breadth, and they have afforded the structural features given in the generic character*.

Sarcophysa.

Among the plants collected by Goudot and Purdie in New Granada, is one that nearly approaches *Solandra*, *Juanulloa* and

* A representation of this species with sectional details, and an analysis of the flower of *J. Hookeriana*, are shown in plate 46.

Marckea, not only in its scandent habit, with large coriaceous leaves, but in the form of its corolla. It differs however from those genera in having a large, ovate, fleshy, tubular calyx, which is much inflated in the middle, with a remarkably contracted mouth, bursting irregularly with the growth of the fruit, and not divided into distinct sepals as in the other genera above-mentioned; it is also distinguishable from *Juanulloa* by its long, handsome, tubular corolla. Its name is derived from *σὰρξ, caro,* and *φύση, vesica,* because of its fleshy inflated calyx.

Sarcophysa (gen. nov.).—*Calyx* magnus, coloratus, ovatus, inflato-tubulosus, crasso-carnosus, ore coarctato, breviter 5-partito, laciniis acutis, erectis, persistens, sed non augescens. *Corolla* cylindrico-tubulosa, tubo medio subinflato, calyce 3-plo longiore, limbo breviter 5-lobo, lobis acutis reflexis, staminibus styloque inclusis. *Bacca* ovata, styli basi apiculata, calyce coriaceo irregulariter fisso vestita. Cætera ignota.—Suffrutex *scandens Novæ Granadæ,* folia *alterna, ovata, coriacea*; racemi *penduli, pauciflores*; corolla *speciosa.*

1. *Sarcophysa speciosa* (n. sp.);—ramis dependentibus, dense tomentosis; foliis ovatis, basi obtusis, apice breviter angustatis, crasso-coriaceis, nervis profunde impressis, supra glaberrimis, minute ruguloso-punctulatis, subtus flavido-tomentosis, pilis stellato-brachiatis, petiolo crasso, reflexo, canaliculato, subbrevi; calyce magno, colorato; corolla punicea?, calyce duplo longiore, extus subtomentosa; bacca magna, calyce vix aucto, fisso, æquilongo, inclusa.—Nova Granada, *v. s. in herb. Hook.* (Quindiu et Palmas, *Goudot*; Quindiu, *Purdie*).

This appears to be a scandent plant; its leaves are quite smooth above, with a finely rugulose or shagreened surface; below they are, as well as the petiole, covered with a dense orange-coloured and short tomentum; they are 4 inches long, $2\frac{1}{2}$ inches broad, on a thick channeled petiole half an inch long; the flowers appear racemose; the calyx $1\frac{1}{2}$ inch long, nearly an inch in diameter; the corolla is $2\frac{1}{2}$ inches in length, 8 lines diameter in the middle, contracted at both extremities to 5 lines, with oblong triangular teeth, 3 lines long; the berry unripe is $1\frac{1}{4}$ inch long, $\frac{3}{4}$ inch diameter, surrounded by the persistent coriaceous calyx, which is irregularly split on one side to the base; the hairs of the tomentum are distinctly brachiate*.

Ectozoma.

In the Pavonian herbarium, preserved in the British Museum, I have noticed a plant that offers much analogy with the fore-

* This species is shown in plate 47.

going genera, agreeing with all the *Solandreæ* in its habit, its coriaceous leaves, and terminal paniculated inflorescence, and although its flowers are much smaller, they agree in having a fleshy tubular corolla with five short lobes, which are imbricated in æstivation. They present the unusual character of the insertion of the stamens upon a free perigynous ring, as in *Triguera*, but with the peculiarity of being adnate upon its external face; hence the derivation of its generic name, from ἐκτὸς, *extra*, and ζῶμα, *cingula*. In most cases where the stamens spring from a perigynous ring, the filaments originate from its inner face, as in *Salpichroma*, or from its margin, as in *Triguera*; but we have a somewhat analogous case in *Campanula medium*, where the filaments are distinctly adnate upon the back of the large, broad processes, that form the fornix around the base of the style, peculiar to that genus. Its generic features may be characterized as follows:—

Ectozoma (gen. nov.).—*Calyx* campanulatus, brevis, crassus, subæqualiter 5-dentatus, dentibus triangularibus, erectis. *Corolla* breviter tubulosa, medio subinflata, crasso-carnosa, limbo 5-lobo, lobis suborbicularibus, æstivatione imbricatis. *Stamina* 5, æqualia, inclusa, *filamenta* brevissima, compressa, e dorso annuli perigyni liberi tenuis margine ciliati orta. *Antheræ* oblongæ, imo subcordatæ, apice mucronulatæ, lobis coriaceis connectivo dorsali lineari parallele adnatis, margine longitudinaliter dehiscentibus. *Ovarium* obovatum. *Stylus* erectus. *Stigma* fere exsertum, globosum, sub-2-lobum. *Fructus* ignotus.—Suffrutex *Ecuadorensis, glaberrimus, subscandens*?; folia *alterna, ovata, vix acuta*; inflorescentia *paniculata, terminalis*.

1. *Ectozoma Pavonii*;—glaberrima, ramulis compressis, subangulatis, epidermide rimosa; foliis late ovatis, basi apiceque obtusiusculis, vix acutis, crasso-coriaceis, supra impresso-punctulatis, venis insculptis, subtus pallidis, venis prominentibus, petiolo crasso canaliculato; racemis paniculatis, 2–3, terminalibus; floribus breviter pedicellatis, calyce carnoso aurantiaco, piloso, pilis brevibus articulatis; corolla carnosa, aurantiaca, glabra, limbi laciniis crassiusculis.—Guayaquil, *v. s. in herb. Mus. Brit.* (*Pavon*).

This plant bears much resemblance in its habit to *Juanulloa* and *Sarcophysa*. Its branchlets are much compressed, covered with a shining peeling bark; the leaves are 5 inches long, $3\frac{1}{2}$ inches broad, on a thick channeled petiole of half an inch in length. Its paniculate branching raceme is about 2 inches long, each pedicel is 1 line long; the calyx, 4 lines in length and 3 lines in diameter, is very fleshy and rugosely pilose, and is divided to one-third its length into five equal erect teeth; the tube of the corolla is 3 lines long, and the circular lobes of its border 1 line

in diameter, the tube is somewhat narrowed at its base and in the throat; the antheriferous free ring arises in the constriction of the tube. It is possible that in the specimen referred to, the flowers are only in a young state, and that when fully grown they may assume a somewhat greater development, but I give the description in accordance with the specimen as it exists*.

Solandra.

I notice this genus, in order to confirm what has been already advanced respecting it in the preceding volume of this work p. 176, when I endeavoured to show that its relation is decidedly with *Juanulloa*, *Marckea* and *Sarcophysa*, constituting with these genera a distinct tribe of the *Atropaceæ* or *Atropineæ*, and in no degree related to *Datura*, with which it has been classed by all botanists heretofore. It will be seen to approach *Juanulloa* in its large tubular calyx, which splits generally on one side, in consequence of the growth of its large fleshy berry, in the structure of which there exists a considerable resemblance in both genera, but it differs from that genus, in its much larger and more campanular corolla. It bears also great analogy with *Brunsfelsia*, in its large, yellow, fleshy border, with five rounded lobes, greatly fimbriated on their margins, and deeply imbricated in æstivation, and also in its large berry filled with pulp; but it differs from this last-mentioned genus, in its general habit and in the structure of its stamens. It will serve to connect the *Solandreæ* with the *Brunsfelsieæ*, and in the linear arrangement shown in the tabular view, p. 166, as above quoted, it should have been placed below *Ectozoma*, and immediately preceding *Brunsfelsia*. I have not been able to examine its seeds or to find any analysis of its structure, any farther than that the embryo is said to be arcuate; in this respect it will probably resemble *Juanulloa*, *Marckea* and *Franciscea*, where it is terete, nearly straight or only slightly bent, with short, ovate cotyledons. The following is offered as an amended generic character:—

Solandra, *Swartz*. (Char. emend.)—*Calyx* 5-sepalus, persistens; *sepala* lanceolata, acuta, marginibus in tubum longum, cylindraceum, 5-angulatum, inæqualiter et breviter 2–3-partitum, demum hinc fissum, valvatim conniventia. *Corolla* magna, inferne valde coarctata, carnosa, cylindracea, 5-gona, superne ventricoso-campanulata, crassa, 5-nervis, venis anastomosantibus, limbo 5-partito, laciniis revolutis subæqualibus rotundatis margine inciso-crispatis, æstivatione valde imbricatis. *Stamina* 5, æqualia, ad constrictionem tubi inserta,

* A representation of this plant with details is shown in plate 48.

inclusa; *filamenta* glabra, subulata, erecta, cum stylo declinantia; *antheræ* approximatæ, oblongæ, basi subcordatæ, sub-4-gonæ, apicifixæ, 2-loculares, margine longitudinaliter dehiscentes. *Ovarium* conicum, 2-loculare, placentis cum dissepimento cruciformibus, hinc in loculis centralibus, valde incrassatis, lunulatis, undique seminigeris. *Stylus* tenuis, subexsertus, declinatus, superne subrecurvus. *Stigma* parvum, sub-2-lobum, intus glandulosum. *Bacca* calyce fissa cincta, ovata, apice conica, imo e placentis cum pericarpio demum connatis breviter sub-4-locularis, superne 2-locularis; *semina* plurima, oblonga, compressa, reniformia, in pulpam carnosam nidulantia. *Embryo* intra *albumen* carnosum arcuatus.—Frutices *sarmentosæ Antillanæ et Mexicanæ*; folia *alterna, ad apicem ramorum conferta, obovato-oblonga, integra, subcarnosa*; flores *terminales, solitarii, rarius* 2- *vel* 3-*ni, maximi, albido-lutescentes, rubro-picti.*

1. *Solandra grandiflora,* Swartz, *Act. Holm.* 1787, 300. tab. 11; *Fl. Ind. Oc.* i. 387. tab. 9; *Rchb. Fl. Exot.* ii. 41. tab. 134; *Jacq. Hort. Sch.* i. 21. tab. 45; *Salisb. Linn. Trans.* vi. 100. tab. 6; *Meen, Exot. Pl. Kew.* tab. 6; *Bot. Mag.* tab. 1874; *Tussac, Fl. des Antilles,* ii. 49. tab. 12. S. scandens, *Wild. Reliq. Rom. Sch.* iv. 700. Datura sarmentosa, *Lam. Encycl.* vii. 463; —viscido-pubescens, caule sarmentosa, radicante; foliis alternis, aggregatis, petiolatis, obovato-oblongis, acuminatis; floribus terminalibus, solitariis, rarius 2–3 aggregatis, laciniis corollæ obtusissimis, crenato-laciniatis, antheris sublunatis, 4-cornibus, apiculatis, basi parum fissis, genitalibus subexsertis.—Jamaica.

2. *Solandra nitida,* Zuccag. *Cent. Roem. Coll.* 128. no. 40. Portlandia grandiflora, *Hort. Batav.*;—caule arborescente, ramis flexilibus, elongatis, divaricatis, cortice rimoso; foliis glaberrimis, nitidis; flore glabro, calyce 4-fido, corollæ limbo 6–7-fido, segmentis rotundatis, crenato-undulatis, revolutis; antheris 2-cornutis.—Jamaica.

3. *Solandra guttata,* D. Don. *Bot. Reg.* tab. 1551; Tecomaxochitl, *Hern. Mex.* 408. *cum icone*;—frutex erectus, ramosus, ramis foliorum lapsorum cicatricibus hispidis; foliis late elliptico-oblongis, acutis, subtus lanuginosis; floribus terminalibus, solitariis; calyce tubuloso, 3-dentato, dentibus inæqualibus, acutis; corolla ampla, pallide lutea, fauci purpureo-maculata, tubo longiori infundibuliformi, limbi laciniis latissimis, rotundatis, crispato-undulatis.—Mexico.

Dyssochroma.

A recent inquiry into the different species of *Solandra*, with the view of determining the true limits of that genus, has con-

vinced me that a considerable difference of structure exists between *Solandra grandiflora* and *S. viridiflora*; upon comparing these carefully, we cannot fail to arrive at the conviction, that these two species must be held to be generically distinct. In the former instance, the calyx has the shape of a large and cylindrical tube, irregularly cleft in the mouth into three unequal rather short teeth; it does not increase in size, but, in consequence of the growth of the fruit, splits on one side, by a longitudinal fissure, to the base; in *S. viridiflora*, on the contrary, the calyx consists of five, very distinct, lanceolate divisions, all free to the base, which at first are slightly connivent by their somewhat thickened margins, but which are easily, and soon become, separated into distinct sepals. The corolla in *Solandra grandiflora* is much larger, more campanulate, of thicker consistence, of a yellowish colour, with deep red nervures, and with a border of five large rounded lobes, remarkably crenated or fimbriated on their margin, and these are considerably imbricated in æstivation, one lobe being quite interior, and another altogether exterior: the stamens are also very glabrous. On the contrary, in *S. viridiflora*, the corolla, of a greenish lurid white, is deeply divided (half-way down) into five equal, revolute, lanceolate, acuminated and entire segments, which are quite valvate in æstivation, and connivent by their somewhat inflected tomentose margins: the stamens are swollen and very sericeously pilose at their base; in drying, both calyx and corolla become black, which does not occur in the true species of *Solandra*: in the latter genus the flowers are always terminal, whereas in *S. viridiflora* they are solitary and axillary, or at least grow out of several nearly terminal axillary fascicles of leaves: there are some other minor points of difference that will be traced in the details of the characters described. From these facts it will be seen that the new genus, of which the *Solandra viridiflora* may be considered the type, must be referred to the true *Solanaceæ*, and that it will belong to the *Jaboroseæ*, serving to connect that tribe with the *Iochromeæ*, and closely allied to *Salpichroma* and *Nectouxia*. I have called it *Dyssochroma*, from δύσσοος, *æger*, and χρῶμα, *color*, on account of the lurid sickly green colour of its large flowers, which become black as they wither, or lose their moisture in drying, a character common to all the *Jaboroseæ*. I have not been able to examine the embryo of this genus, but we may expect it will prove very different in form from that of *Solandra*. The following may be considered as its generic character:—

Dyssochroma, gen. nov.—*Calyx* magnus, 5-sepalus, persistens; *sepala* lanceolata, acuminatissima, primum marginibus in tubum 5-angulatum conniventibus, semicylindrica, demum li-

bera, erecta. *Corolla* carnosa, tubo imo cylindrico, angulato, superne infundibuliformi, aut ventricoso-campanulato, 15-nervi, limbo æquilongo, 5-partito, laciniis æqualibus, longe lanceolatis, acuminatissimis, integris, 3-nerviis, circinato-revolutis, æstivatione valvatis, marginibus tomentellis, subintroflexis. *Stamina* 5, æqualia, ad constrictionem tubi adnata, erecta, longissime exserta; *filamenta* subulata, imo incrassata, et sericeo-pilosa, superne glabra; *antheræ* lineares, apice mucronulatæ, imo cordatæ, in sinu dorsi affixæ, 2-loculares, loculis connectivo angusto parallele adnatis, intus longitudinaliter dehiscentibus. *Stylus* erectus, staminibus longiusculus, apice incrassatus. *Stigma* 2-lobum, lobis oblongis, adpressis, intus et marginibus recurvis glanduloso-viscosis. *Ovarium* conicum, disco carnoso magno impositum, 2-loculare, placentis centralibus dissepimento adnatis, multiovulatis. *Bacca*; cætera ignota.—Suffrutices *Brasilienses, scandentes, glabræ*; folia *alterna, in ramis laxa, in turionibus florentibus fasciculatis, ellipticis, acuminatis*: flores *pedunculati, e fasciculis solitarii, cernui, siccitate nigricantes*; corolla *albido-viridescens*.

1. *Dyssochroma viridiflora.* Solandra viridiflora, *Sims, Bot. Mag.* tab. 1948; *Link & Otto, Ic. Pl. sel.* 101. tab. 47;—foliis elliptico-oblongis, utrinque attenuatis, glabris, petiolatis, deciduis; floribus magnis, solitariis, calyce glaberrimo, corolla tubo viridescente, limbo lurido-albescente.—Brasilia, Prov. Rio de Janeiro, *v. v. et s. in herb. meo et Hook.* (*Gardn. no.* 502).

I found this plant growing at Tejuca and in the Organ mountains: it is altogether glabrous: the stems are sarmentose, and in the younger branches the leaves grow in dense fascicles, which, as they fall off, leave them covered with crowded cicatrices, giving them an areolate rugose appearance; these terminate in a straight, angular, smooth stem, covered with a shining bark that readily peels off; the axils here are from $1\frac{1}{2}$ to 2 inches apart, and each solitary petiole is articulated in a projecting cup, from which a sharp ridge becomes decurrent on the stem below it; the leaves are $4\frac{1}{2}$ inches long, 2 inches broad, on a channeled petiole $\frac{1}{2}$ to $\frac{3}{4}$ inch in length; the peduncle is $\frac{3}{4}$ inch long; the calyx $1\frac{1}{2}$ inch in length, $\frac{1}{2}$ inch diameter; the corolla including the lobes, at the period of opening, is 4 inches long, and when the segments are coiled back, $2\frac{1}{2}$ inches long; the cylindrical portion of the tube, $\frac{3}{4}$ inch long, is included within the calyx, from which point it becomes gradually funnel-shaped, and a little below the mouth is somewhat ventricose, and about 1 inch in diameter, the lobes of the border being $1\frac{1}{2}$ inch in length and 5 lines broad at base; these are marked by three parallel nerves which are continued along the tube; the stamens and style are exserted $1\frac{3}{4}$ inch be-

yond the mouth of the tube, the anthers being 6 lines long and a line broad; the style thickens towards the summit, and is terminated by a stigma formed of two adpressed lobes, lined within by a thick viscous gland; the ovarium is about 3 lines in diameter and 3 lines in height, quite conical, and seated on a large fleshy and coloured gland.

2. *Dyssochroma longipes*? Solandra longipes, *Sendt. in Mart. & Endl. Fl. Bras.* vi. 159; *Walp. Rep.* vi. 573;—fruticosa, glabra, foliis congestis, glabris, utrinque acutis, integerrimis; floribus nutantibus; pedicellis calycem subæquantibus, vel superantibus, fructiferis valde elongatis: calyce 5-partito; corolla infundibuliformi, e basi sensim dilatata, limbo breviter 5-fido, laciniis acutis revolutis: stigmate longissimo spatio in stylum decurrente.—Brasilia australi.

The above is all the information I have been able to obtain of this species: it will be seen to differ in no respect from the preceding one (as far as we may judge from the foregoing characters) except in the shorter lobes of the corolla: the gradual dilatation of the corolla, without any sudden ventricose enlargement, is very often seen in *D. viridiflora*.

Cacabus.

This genus was first proposed by Bernhardi for a Peruvian plant of Dombey's collection, which was many years before accurately described and figured by L'Heritier (Stirp. Nov. Angl. p. 43. tab. 22), under the name of *Physalis prostrata*, and which appears to have since escaped farther notice: I find other species allied to it, which are all distinguished by their inflated calyx, generally of very delicate texture, remarkably reticulated, marked by dark green lines and veins, and which, swelling after the fall of the flower, eventually incloses the fruit, as in *Physalis* and several other genera. They have all herbaceous stems, are of a prostrate or straggling habit, and they bear a very striking resemblance to *Nolana*, especially in their fleshy flexuose branches, often geminate leaves, large campanular blue flowers, with a somewhat pentangular border, and marked with fifteen longitudinal nervures, as in that genus: the stamens are also included and somewhat unequal in size: indeed so near is this similarity in external appearance, in one species, that I have constantly passed over, without suspicion, a specimen of Mathews's collection, named by him "*Nolana spathulata*, R. & P.," which I did not consider it necessary to examine, as it was not in fruit.

There exists in Sir William Hooker's herbarium, a plant belonging to this genus, which appears to correspond well with the description of the *Nolana inflata* of the 'Flora Peruviana,' a species which its authors neither saw nor examined, the drawing

and details there given having been furnished by their draughtsman Tafalla, who probably never looked to the structure of the fruit, concluding the plant to be similar to the other species of *Nolana* there described: it is to be observed, that these species are as yet quite unknown to modern botanists, except from those descriptions, and may therefore be doubted as appertaining to that genus.

In all the specimens I have examined belonging to the genus *Cacabus*, the ovarium is 2-celled, with a slender membranaceous dissepiment, along the axile line of which, the free placentæ are respectively attached at right angles; these are furcated and fleshy, extending near to the walls of the pericarp, so that when the fruit is cut open, the dissepiment being scarcely visible, the placentations, with the attached seeds, appear disposed in a somewhat cruciform shape, seemingly as if the berry were 4-locular. The fruit, according to L'Heritier (*loc. cit.*), is a berry with an aqueous juice, as in *Nicandra*, and which, upon becoming dry, leaves a subcapsular, brittle, valveless shell, and which is bilocular with a membranaceous partition: as in *Physalis*, this berry is inclosed within a much larger ventricose calyx. Upon the summit of the ovarium and of the immature berry is seen a small flattened prominent gland, out of which the style originates: this bears much analogy to the larger epigynous gland so conspicuous in the ovarium of *Hyoscyamus*, and to which is attributable the peculiar mode of dehiscence in the fruit of that genus; but in *Cacabus* there is no such opercular dehiscence, although the gland is visible in the apex of the cells after the opening of the pericarp; a similar disc exists also in *Thinogeton*. I propose for this genus the following character:—

Cacabus, *Bernh.* — *Calyx* ventricosus, urceolato-subglobosus, membranaceus, inflatus, 10-angularis, 5-dentatus, dentibus inæqualibus, acutis, erectis, angulis nervosis, persistens et accrescens. *Corolla* campanulata, tubo imo breviter coarctato, subito ampliato, limbo campanulato, magno, margine explanato, subintegro, sinuato-pentangulari, 15-nervi, nervis in angulis ternatim parallelis, æstivatione ignota. *Stamina* 5, inclusa, fere æqualia; *filamenta* ad coarctationem tubi adnata, filiformia; *antheræ* ovales, erectæ, 2-lobæ, lobis parallele adnatis, margine longitudinaliter dehiscentibus. *Ovarium* ovatum, substipitatum, apice glandulo parvo carnoso donatum, 2-loculare, placentis dissepimento tenuissimo utrinque adnatis, cruciatim dispositis, et demum divaricatim 2-fidis, multiovulatis. *Stylus* filiformis, longitudine staminum. *Stigma* elongatum, 2-lamellatum, lobis crassis subconniventibus intus stigmatosis. *Bacca* intra calycem auctum, vesiciformem, venoso-membranaceum,

reticulate pictum inclusa, subrotunda, exsucca, cortice fragili evalvato, 2-locularis, dissepimento tenui, placentis subcruciatis seminigeris. *Semina* numerosa, subreniformia, compressa, *testa* rugosa, hilo laterali marginali. *Embryo* intra *albumen* carnosum teres, subannularis, *radicula* angulo basali spectante et hilo evitante, *cotyledonibus* semiteretibus æquilonga.—Herbæ *Americæ meridionalis prostratæ, subsuccosæ, pilosæ, Nolanæ facie*; folia *in axillis alterna, geminata, ovata, sinuato-angulosa, petiolata*; flores *gemini, extra-axillares, pedunculati*; corolla *violacea.*

1. *Cacabus prostratus,* Bernh. *Linn.* xiii. p. 360. Physalis prostrata, *L'Herit. loc. cit.*; *Jacq. Ic. Pl. Rar. Am.* tab. 38; *Andrews, Rep.* tab. 75; *Nees ab Esenb. Linn.* vi. p. 480. P. Limensis, *Retz. Observ.* v. p. 22. Physaloides prostrata, *Mönch. Method.*; —herbaceus, annuus, pilis articulatis patentibus vestitus, caule prostrato; ramulis dichotome flexuosis; foliis radicalibus oppositis, caulinis alternis, et geminis, altero minori, late ovatis, sinuato- vel repando-angulatis, basi subinæqualibus, obtusis, supra glabris, subtus villosis, margine ciliatis, longe petiolatis, petiolo canaliculato dilatato, ciliato, folio æquilongo: pedunculis solitariis vel geminis, in axillis lateralibus, floriferis erectis, demum reflexis, elongatis; corolla cærulea, imo albido-radiata; bacca globosa, glandulo parvo epigyno apiculata, calyce membranaceo multo majori recondita.—Peruvia, in maritimis? ad Chancay et Chorillos, Prov. Limæ.—*v. s. in herb. Soc. Lin.* (*ex hort. cult.*); *in herb. Hook.* (Palaria, *ad sinum* "los Chorillos" *dictum, MacLean*).

It is unnecessary to offer any detailed account of this species, as we find so excellent an account of it given by L'Heritier, who described it from living plants, at that time growing in England; it seems however to have been long lost to our gardens, although it was cultivated in Lee's nursery grounds in 1793, according to the specimen preserved in Sir J. E. Smith's herbarium. The leaves are from 2 to $2\frac{1}{2}$ inches long, $1\frac{1}{2}$ to $1\frac{3}{4}$ inch broad; they are finely reticulated, with a number of raised minute dots in each areole; the petiole is about 2 inches long, the flowers are quickly fugacious; the corolla is 1 inch long and 1 inch diameter across the mouth, the contracted base of the tube being 3 lines in length; the filaments are 3 lines long, slender, and hairy below; the fructiferous calyx is white, and almost transparent, hairy, globose, contracted in the mouth, with ten longitudinal nervures and anastomosing reticulations of a dark green colour, and is half an inch in diameter; the inclosed berry, when ripe, is 3 lines in diameter, 2-celled, with bifurcate placentæ bearing a number of minute rugose seeds; it is quite devoid of pulp; the

pericarp is membranaceous, indehiscent, and its apex is marked with a callous discoid process, resulting from the hardening of its epigynous gland.

2. *Cacabus Nolanoides* (n. sp.);—herbaceus, molliter villosus, caule striato, dichotome ramoso; foliis geminis, altero multo minori, ovatis, crassiusculis, undulato- vix sinuato-angulosis, margine ciliatis, basi inæqualibus, utrinque glabris, inferne nervis pilosulis, petiolo late dilatato, ciliato, folii longitudine; floribus solitariis, lateraliter extra-axillaribus, pedunculo florifero erecto, fructifero reflexo, corolla cærulea : calyce inflato, membranaceo, 10-nervi, reticulatim picto.—Peruvia, *v. s. in herb. variis* (*Mathews, no.* 839, *sub nomine Nolanæ spathulatæ*).

The leaves of this species are nearly oval, 4 inches long, $2\frac{1}{4}$ inches broad, upon a fleshy dilated petiole, with winged ciliate margins, $2\frac{1}{4}$ inches long and nearly 2 lines broad, subamplexicaul at base. The peduncle in flower is $1\frac{1}{4}$ inch long, the calyx is 6 lines long and 4 lines broad, the corolla is $1\frac{1}{4}$ inch long, and $1\frac{1}{4}$ inch across its somewhat expanded and nearly entire border. The peduncle in fruit is reflexed, $1\frac{1}{2}$ inch long; the enlarged calyx is 8 lines long and 7 lines broad, the inclosed berry measuring 3 lines in diameter. This plant, which so greatly resembles the figure of *Nolana spathulata* in the 'Flora Peruviana,' differs from it in the size of its leaves, the length of the petiole, the shape of the calyx, the size of its corolla, its more entire, not deeply-lobed border, the shape of its stigma, its vesicular calyx, not fleshy and subsequently bipartite, and finally by the very different structure of its fruit. It agrees in many respects however with the description of the text*.

3. *Cacabus? inflatus*. Nolana inflata, *R. & P. Flor. Peruv.* ii. p. 7. tab. 112. fig. *a*;—herbaceus, pedalis, prostratus, annuus, foliis radicalibus confertis, oblongis, in petiolum longum imo decurrentibus, caulinis geminatis, ovatis, subobtusis, basi inæqualibus, breviter petiolatis, petiolo dilatato; floribus geminis, ex axillis lateraliter ortis, corolla speciosissima, albo-violacea; fructu calyce striato, ventricoso, incluso.—Peruvia (in arenosis Prov. Arequipæ).

From its inflated calyx, there is every reason to conclude that this plant belongs to this genus, rather than to *Nolana*. It was not seen by Ruiz and Pavon, being only known to them from the sketch sent them by their draughtsman Tafalla; the fruit is not described as consisting of distinct carpels, but as "semina 4-locularia," which may have been construed from "fructus 4-locularis,"

* A drawing of this species, with generic details, is shown in plate 49.

which the fruit of *Cacabus* almost appears to be, from its projecting placentæ. It has a prostrate habit, is about a foot long, its radical leaves are 4 inches in length, 2 inches broad, upon a petiole $1\frac{3}{4}$ to 2 inches: the cauline leaves are $1\frac{1}{2}$ inch long, 1 inch broad, on a petiole of 3 lines; the peduncles are $1\frac{1}{2}$ inch, the calyx 8 lines long, swollen in the middle, 4 lines in diameter, and 10-nerved: the corolla is nearly 2 inches long, $1\frac{3}{4}$ inch diameter across the mouth, which is obsoletely 5-lobed. In all the other species of *Nolana* mentioned in the work above referred to, the calyx is described as being deeply 5-cleft, with the divisions sagittate or cordate at the base, as in our well-known garden species *Sorema prostrata*; but in the plant under consideration the calyx is said to be distinctly ventricose and striated, which agrees with the character of *Cacabus*.

Thinogeton.

This interesting genus was founded by Mr. Bentham upon one of the plants collected on the coast of the Pacific, near Guayaquil, during the voyage of the 'Sulphur;' it is identical with *Dictyocalyx*, proposed by Dr. Hooker for a plant obtained by Mr. Darwin in one of the islands of the Gallapagos group. In many respects its characters approach so closely upon *Cacabus*, that some might feel disposed to consider them as congeneric; its habit, however, is not so herbaceous, its stems are more straggling, terete, and though fistulose, are more woody; the petiole is rounder, thicker, and grows to an unusual length (three or four times that of the blade) after the full growth of the leaf; the corolla is less campanular, more infundibuliform, and after the impregnation of the ovarium, coils up spirally as in *Convolvulus*, and remains attached to the calyx until the fruit is matured; the stamens are more unequal and shorter, the filaments less slender and more arched at their origin than in *Cacabus*; the epigynous gland crowning the ovarium is much larger, more than hemispherical, being gradually lost in the texture of the more slender basal portion, while in *Cacabus* it is distinct, prominent, and much smaller, rising on the summit of the germen, like a small bulbular expansion of the style. A still more marked difference is seen in the calyx, which in the florescent state in *Thinogeton*, is of much smaller diameter, quite tubular and invests the contracted base of the corolla; it is of thicker texture, and marked by ten prominent fleshy ribs, tapering gradually into the peduncle: in *Cacabus*, on the contrary, the calyx is at least three times the diameter of the base of the corolla, is more or less globular, of extremely thin and transparent texture, venously reticulated, plicated and deeply 5-angular, the angles being saccate at base; the peduncle in *Thinogeton*, after the impregnation of

the ovarium, becomes immediately deflexed, grows to four times its former length, and is afterwards much thickened at its apex: the teeth do not increase in size, but the tube, as in *Physalis*, becomes somewhat vesicular, reticulated, and 10-ribbed; expands to three times its former length, and five times its breadth, its texture remaining much thicker, when compared with the greatly inflated and delicately membranaceous web, which encloses the berry in *Cacabus*. The structure of the ovarium is similar to that of the last-mentioned genus, but the furcated placentæ are again divided, and secrete an aqueous juice, in which the seeds are nourished; the dissepiment remains membranaceous, but the placentæ at length become hard and woody, and the cells dry and capsular, while in *Cacabus* the pericarp, the placentæ and the dissepiment are all more or less membranaceous. The fruit, though somewhat fragile, does not burst by an opercular line, as in *Hyoscyamus*, because of the very gradual attenuation and absorption of its epigynous gland into the substance of the pericarpial membrane, not less than on account of the thickening and indurescence of the dissepiment and placentæ: for these reasons, it does not open by a sharp horizontal line, as in that genus, but remains a brittle, indehiscent putamen, with a tendency to break by an irregular transverse line in its thinnest part.

THINOGETON, Bth. Char. ampl.—*Calyx* tubulosus, 10-striatus ad medium 5-partitus, laciniis acutissimis, erectis, subæqualibus, persistens et augescens. *Corolla* infundibuliformis, tubo imo coarctato, dein gradatim ampliato, 15-nervio, limbo 5-fido, lobis brevibus subinæqualibus, 3-angularibus. *Stamina* 5, inclusa, inæqualia, corolla 3-plo breviora; *filamenta* in coarctationem tubi inserta, hinc fornicata, erecta, gracilia; *antheræ* conniventes, oblongæ, apicifixæ, 2-loculares, loculis parallele adnatis, rima marginali dehiscentibus. *Ovarium* ovatum, 2-loculare, dissepimento tenui, placentis cruciformibus utrinque adnatis, in locellis furcatis, carnosis, undique ovuligeris. *Stylus* leviter curvatus, filiformis, staminibus excedens. *Stigma* spathulato-dilatatum, compressum, sub-2-labiatum. *Bacca* exsicca, intra calycem auctum vesiciformem, venoso-reticulatum, 10-costatum inclusa, subglobosa, cortice coriaceo, superne crassiore, inferne subfragili, evalvato, 2-locularis, placentis furcatis coriaceis, seminibus plurimis gerentibus. *Semina* compressa, subreniformia, testa scrobiculata, hilo laterali, marginali. *Embryo* intra *albumen* carnosum teres, subspiralis, radicula angulo basali spectante, hilo evitante, *cotyledonibus* semiteretibus paulo longiore.—Herbæ *Americæ intertropicæ prostratæ, subpilosæ, subcarnosæ, Convolvuli facie*; foliis *alternis, axillaribus, oblongis, acutis, sinuato-incisis, vel undulatis, lon-*

gissime petiolatis, petiolo *canaliculato, demum producto*; floribus *solitariis vel binis, pedunculatis subsecundis*.

1. *Thinogeton maritimum*, Bth. Voy. Sulph. 142 ;—viscoso-pubescens, carnosulum; foliis lanceolatis vel lineari-oblongis, sinuoso-lobatis, vel grosse dentatis, basi in petiolum alatum angustatis, crassiusculis, longiuscule petiolatis, floralibus decrescentibus; floribus solitariis vel geminis, lateralibus, axillis approximatis hinc pseudo-paniculatis et terminalibus, corolla sub-violacea.—Ecuador, ad Tumbez, in littoris maritimis; *v. s. in herb. Hooker* (Lima, *Cuming, no.* 972).

This is a prostrate plant, with much the habit of a *Nolana*, its branches measuring a foot and upwards. Its petioles and pedicels are erect, and therefore are all somewhat secund: I have not seen any cauline leaves, but the floral leaves are much smaller, greatly narrower, and upon a shorter petiole than in the following species; the pedicels are 2 to 4 lines long, the calyx is 3 lines long, and 1 line diameter, swelling afterwards to a length of 7 lines and a diameter of 5 lines: the corolla is 15 or 16 lines long, and 10 to 13 lines broad across the border; it is pubescent outside, is persistent, and on withering, coils up in a spiral form, when the peduncle increases to a length of 9 lines and becomes suddenly reflexed. The berry is 4 lines in diameter, enclosed within the enlarged vesiciform calyx.

2. *Thinogeton Miersii.* Dictyocalyx Miersii, *Hook. fil. Linn. Trans.* xx. p. 203 ;—subpubescens, foliis ovatis, acutis, basi inæqualibus, cordato-auriculatis, et in petiolum angustatis, irregulariter sinuato-angulatis, angulis subobtusis, 3–5-nerviis, crasso-coriaceis, utrinque pilis brevibus rigidiusculis articulatis conspersis, longissime petiolatis; floribus solitariis vel geminis, lateralibus, corolla sub-violacea extus puberula, limbo vix explanato, staminibus corolla brevioribus.—Ins. Gallapagos, *v. s. in herb. Hook.* (Charles et Albemarle Islands, *Darwin.*)

This plant possesses a habit similar to that of the former species. The branching stems of woody texture are fistulose, smooth and terete. The leaves are from $2\frac{1}{2}$ to 3 inches long, 2 to $2\frac{1}{2}$ inches broad, on a channeled petiole 5 inches long, that is nearly rectangular with the stem: they are almost smooth, or sparsely covered with very short rigid hairs: the peduncles are slender, $\frac{1}{2}$ to 1 inch long; the calyx is 5 lines long, 2 lines diameter; the corolla is $1\frac{1}{2}$ inch long, contracted for the length of 5 lines to a diameter of 1 line, and thence gradually swelling into a funnel shape, is 1 inch across the mouth; three nearly parallel nervures extend along the middle of the lobes to the base of the tube; the stamens arise in the contraction of the tube, and the anthers.

which are double the length of those of the former species, are connivent around the style in the middle of the corolla; the flower on withering coils up in a spiral form, and the peduncle, subsequently deflexed, increases to a length of $1\frac{1}{2}$ to $1\frac{3}{4}$ inch, becomes thicker, and enlarges considerably at its apex; the calyx swells to an oblong oval form, nearly an inch long, 7 lines broad, 10-angular, with ten prominent costate ribs, vesiciform, with the mouth closed by five short connivent teeth: it encloses a berry 7 lines long, 5 lines diameter; the pericarp is almost a putamen, the upper moiety being thick and coriaceous, the lower half thinner and more fragile; the dissepiment, and especially the lunated placentæ, become thickened, coriaceous and almost ligneous; it is apparently void of pulp, enclosing several seeds scarcely a line in diameter and much compressed, which are described by Dr. Hooker as being large; but that term is evidently used in comparison with those of *Nicotianum*, with which this genus was thought to hold a close relation; they are on the contrary smaller than in many other genera of this tribe*.

3. *Thinogeton Lobbianum* (n. sp.);—viscoso-pubescens, caule striato, flexuoso; foliis ovalibus, irregulariter sinuato-angulosis et dentatis, imo cordato-auriculatis, et in petiolum longiusculum breviter attenuatis, 3–5-nerviis, tenuioribus, utrinque tomento brevi glanduloso subincano pubescentibus, petiolo tenui valde tomentoso; floribus geminatis, calyce pubescente, corolla sub-violacea, extus puberula, staminibus inæqualibus, corolla 2–3-plove brevioribus.—Columbia et Peruvia; *v. s. in herb. Hook.* (Columbia, *Lobb. no.* 299. Peru, *Maclean.*)

This species is evidently intermediate between the two foregoing: the stem is much smaller, more striated, far more flexuose, with much shorter internodes, and altogether more pubescent than the last described; the leaves are 2 inches long, $1\frac{3}{4}$ inch broad, on a petiole of $2\frac{1}{4}$ inches, but probably the lower leaves are somewhat larger: the peduncles are 9 lines long, slender and erect, but become suddenly deflexed on the withering of the corolla; the calyx is 4 lines long, $1\frac{1}{2}$ line diameter; the corolla $1\frac{1}{4}$ inch long, $\frac{3}{4}$ inch broad in the mouth; the fructiferous calyx becomes almost globular, 5 lines long and 4 lines in diameter, contracted in the mouth, with five erect teeth, and enclosing a nearly globular berry 4 lines in diameter.

Polydiclis.

The *Nicotiana quadrivalvis* of Pursh, and the *Nicotiana multivalvis* of Prof. Lindley, have long been known as anomalous spe-

* A figure of this species, with generic details, is given in plate 50.

cies, which Don placed in his section *Polydiclia* of that genus, and I propose to adopt that name, or rather its more correct derivation, for a distinct genus, in order to embrace these plants, which are distinguished from *Nicotiana* by the different structure of the fruit and other characters. The first-mentioned plant is a native of Missouri, where it is said to be cultivated as tobacco; it was introduced into England in 1811 and figured in the 'Botanical Magazine.' The latter species was first cultivated in England in 1826 and figured in the 'Botanical Register.' They both differ from *Nicotiana* in their globular, three or more celled ovarium, with placentæ projecting from the axis into the middle of the cell, where they become thickened and ovuligerous. The capsule is globular, often very large, umbilicate at the apex, three- to eight-grooved, with as many corresponding septicidal valves, which break away from the shriveled dissepiments. In *Polydiclis multivalvis*, which has a six- or eight-celled ovarium, the placentæ are often pluripartite in each cell, and as they become incrassated, the fruit according to Dr. Lindley presents a series of external spurious cells around the true seminal cavities. Its generic name is derived from πολὺς, *multus*, δικλὶς, *valva*, on account of the greater number of the valves and divisions of its capsule.

Polydiclis (gen. nov.).—*Calyx* globoso-tubulosus, 10–16-nervis, 5–8-dentatus, dentibus valde acutis, inæqualibus, erectis, persistens et augescens. *Corolla* tubo cylindrico, 15- vel pluri-nervio, basi ventricoso, calyce 2–3-plo longiore, limbo late campanulato, ad medium 5–6-fido, laciniis expansis, obtusiusculis, 3-nerviis, venisque anastomosantibus pictis. *Stamina* 5–6, inæqualia, inclusa, medio corollæ inserta, *filamenta* tubo 3-plo breviora, filiformia, *antheræ* ovatæ, 2-lobæ, lobis liberis, appositis, rima exteriori dehiscentibus. *Ovarium* globosum, disco carnoso insitum, 3 ad 6-loculare, placentis ex angulis prominentibus in centro loculorum incrassatis, multiovulatis. *Stylus* erectus, inclusus. *Stigma* clavatum, 3 ad 6-lobum, lobis obtusis, expansis, glanduloso-papillosis. *Capsula* globosa, magna, umbilicata, 3–12-sulcata, calyce aucto arcte cincta, 3-pluriloculari, 3-plurivalvis, valvis septicidalibus dissepimentis demum solutis, sæpe locellis aliis spuriis exterioribus donata. *Semina* plurima, parva, oblonga, compressiuscula, hilo laterali. *Embryo* intra *albumen* carnosum leviter incurvus, *radicula* tereti, angulo basali spectante, *cotyledonibus* ovatis plano-convexis duplo longiore.—Herbæ *Americæ septentrionalis viscoso-pubescentes, odore fœtido*; folia *alterna, ovato-lanceolata, elliptica, utrinque acuminata*; flores *axillares, albidi, reticulato-picti.*

1. *Polydiclis multivalvis.* Nicotiana multivalvis, *Lindl. Bot. Reg.* tab. 833; *Don, Dict.* iv. 466;—viscido-pilosa, foliis carnosis, ovato-lanceolatis, breviter petiolatis, utrinque acuminatis, integris, margine undulatis, demum fere glabris; floribus solitariis, paucis, axillaribus; corolla magna, limbo explanato, albida, venis purpureis picta, 5–6-mera.—Columbia River, in locis saxosis.

This plant is said to be of a strong hircose odour and viscid; the leaves of the specimens I have seen are 6 inches long, $2\frac{1}{4}$ inches broad, on a petiole not longer than $\frac{1}{4}$ or $\frac{1}{2}$ an inch, which, together with the midrib, is fleshy, broad, and semiterete. The peduncle is scarcely more than $\frac{1}{4}$ inch long; the calyx about $\frac{3}{4}$ inch in length, and $\frac{3}{8}$ inch diameter in its broadest part, contracted above, and divided into five, sometimes six very acute lanceolate teeth, one-third of its entire length; it has ten or twelve prominent nervures with intermediate reticulations. The tube of the corolla is cylindrical, somewhat swollen at the base, $1\frac{1}{2}$ inch long, $\frac{1}{4}$ inch diameter; the border is very broad, expanded, about 2 inches across, and divided to nearly half its breadth into five, sometimes six triangular obtuse segments: it is of a whitish colour, with anastomosing purplish lines. The stamens are equal in number to the segments of the corolla, and the anthers rise to the mouth of the tube. The berry is large, globular, $1\frac{1}{4}$ inch diameter, marked with deep grooves, corresponding with the number of cells, which vary from six to twelve; it is umbilicate at the summit, and crowned by the persistent style, its lower half being closely invested by the swollen calyx.

2. *Polydiclis quadrivalvis.* Nicotiana quadrivalvis, *Pursh, Fl. Am. Sept.* i. 141; *Lehm. Hist. Nicot.* c. 45. tab. 4; *Don, Dict.* iv. 466; *Bot. Mag.* tab. 1778;—viscido-pilosa, caule herbaceo, ramoso; foliis oblongis, utrinque attenuatis, integris, superioribus lanceolatis, subsessilibus; floribus 5-meris, ovario 3–4-loculari, calyce pilosiusculo, corolla genitalibusque glabris, stigmate 3–4-lobo.—Missouri.

The leaves of this species appear somewhat smaller than in the foregoing species, and are slightly ciliate on the margin, with jointed articulated hairs; the corolla is also much smaller, and the globular, usually 4-celled capsule, wholly enclosed in the persistent calyx, is about half an inch in diameter.

The *Nicotiana nana*, Lindl. Bot. Reg. tab. 833, referred by Don to his section *Polydiclia*, cannot belong to this genus, as its ovarium is bilocular, and as it corresponds in few respects. The plant has certainly nothing of the habit of a *Nicotiana*, and it is difficult, in the absence of a satisfactory specimen, to determine to what genus it should be referred.

Salpiglossis.

Upon a former occasion (*huj. op.* i. p. 172) many reasons were adduced to show why the tribe of the *Salpiglossideæ*, as constituted by Mr. Bentham (DC. Prodr. x. 190), could not be maintained, and I proposed to limit that tribe simply to *Salpiglossis*, *Browallia*, *Leptoglossis*, and a new genus *Pteroglossis*, all being distinguished by their singularly dilated stigma and the peculiar mode of æstivation of the corolla. A careful examination of *Leptoglossis schwenkioides* has since then offered reasons for placing that genus among the *Petunieæ*. The *Salpiglossideæ*, however, as thus limited, are evidently most intimately allied to the *Petunieæ*, agreeing with them in a somewhat similar form of stigma, the development of their stamens, their capsular fruit, and the very spiral form of the embryo in *Salpiglossis*, and differing from them only in their didynamous stamens and the æstivation of the corolla. The didynamous arrangement of the stamens does not appear to me to offer a sufficient reason for keeping them in an ordinal point of view apart from the *Petunieæ*, and for retaining them in the *Scrophulariaceæ*; indeed in the *Petunieæ* and *Nicotianeæ*, we find an evident tendency towards a didynamous structure, for one of the stamens is constantly shorter than the others, which are in two pairs, while the anther of the fifth is always somewhat smaller, and frequently almost sterile; and on the other hand, I have observed occasionally in *Salpiglossis* a fifth fertile stamen, showing a disposition to return to its normal condition; and I have also before me an instance of a flower with three pairs of stamens, varying in length, with a seventh shorter one, the anther of which, though smaller than the others, is fertile. The position of the *Salpiglossideæ* in the natural system appears to me therefore manifestly in the family which I propose to call *Atropaceæ*, or if considered only as a suborder, *Atropineæ*, according to the arrangement there shown (*loc. cit.* p. 165).

There is little in the genus *Salpiglossis* that calls for observation; one peculiar feature however claims attention, the singular form of its pollen-grains: these are comparatively large and readily distinguished under a common lens, each granule consisting of four agglutinated spherical globules similar in form to the simple pollen-grains of most *Solanaceæ* and *Scrophulariaceæ*: three of these globules are on the same plane, the other being superimposed in the centre, thus forming a sort of rounded tetrahedron, and they adhere so completely that they cannot be separated without bursting. The fact is noticed by Mr. Hassall in his memoir "On the Structure of Pollen" (Ann. Nat. Hist. viii. 100), who states that so curious a circumstance is not singular, as it occurs in *Oxyanthus* in *Cinchonaceæ*, *Leschenaultia* in *Goode-*

niaceæ, and in some species only of *Epilobium* in *Onagraceæ*: the same is also observable in all the genera of the *Epacrideæ* and of *Ericaceæ*, with the exception of *Clethra*, where they are simple. From these analogous facts it is evident that this compound structure of the pollen-grains is not of sufficient importance to affect in any way the ordinal position of *Salpiglossis*.

Mr. Bentham mentions only a single species of this genus, as he considers all our garden kinds as mere varieties of *S. sinuata*. On this head I may remark, that I found in Chile, plants which I always considered to be two very distinct species, viz. *S. sinuata* (my *S. glutinosa*) and my *S. purpurea* (Trav. ii. p. 531); but I have little doubt that *S. picta*, *S. Barclayana*, *S. fulva*, *S. intermedia*, &c. are all hybrid productions from these two species. I always met with *S. sinuata* growing near the coast, its corolla being constantly of a yellowish white, with brownish stripes; on the contrary, I invariably found *S. purpurea* at a much greater elevation near the foot of the main Cordillera, or within its gorges, its flowers being always of a dark lilac, with deep purple lines, and never of the yellowish hue so conspicuous in *S. sinuata*. I cannot however refer to my original specimens, as they were unfortunately lost off Cape Horn with my general Chile collections; but the coloured drawings of both species made in 1820, and which I have preserved, serve to impress these facts strongly on my memory. From the several dried specimens of *Salpiglossis* in Sir William Hooker's herbarium collected by Gillies, Cuming and Bridges, we may detect at a glance the two different species. The following I consider as the amended diagnosis of this genus:—

Salpiglossis, R. & P. (char. emend.).—*Calyx* tubulosus, 10-nervis, 5-dentatus, dentibus subæqualibus, attenuatis, obtusiusculis. *Corolla* infundibuliformis, tubo imo cylindraceo, superne campanulata, compressa, limbo 5-lobo, obliquo, subbilabiato, lobis profunde emarginatis, superiore majore, erectiore, æstivatione reciprocativa*. *Stamina* 5, inclusa, quorum 4 didynama, quinto breviori, sterili; *filamenta* subulata, e constrictione tubi orta; *antheræ* ovatæ, 2-lobæ, basi cordatæ, subversatiles, lobis adnatis, rima marginali dehiscentibus; *pollen* compositum, e granulis 4 aggregatis, quorum 1 superpositum. *Ovarium* conicum, disco carnoso sub-2-lobo impositum, 2-loculare; *placentæ* centrales, dissepimento utrinque adnatæ, multiovulatæ. *Stylus* exsertus, apice compressus, incrassatus, subincurvus. *Stigma* majusculum, transverse dilatatum, semilunare, bilabiato-emarginatum. *Capsula* oblonga, calyce per-

* *Huj. op.* vol. i. p. 172.

sistente tecta, 2-locularis, septicido-2-valvis, valvis chartaceo-coriaceis, 2-fidis, placenta centrali demum solutis. *Semina* plurima, minuta, subangulata, hilo laterali; testa striato-rugosa. *Embryo* intra *albumen* carnosum spiraliter curvatus, teres, *radicula* arcuata, ad angulum basalem spectante, *cotyledonibus* 4-plo longiore.—Herbæ *Chilenses glanduloso-pubescentes*; folia *alterna, lanceolata, inferioribus sinuato-laciniatis, petiolatis, superioribus linearibus, sessilibus, sinuatis, floriferis linearibus, subbracteiformibus.* Inflorescentia *paniculata,* floribus *pedicellatis, pedicellis extra-axillaribus*; corolla *straminea vel purpurea, lineis anastomosantibus picta.*

1. *Salpiglossis sinuata,* R. & P. Syst. Veg. 163; Prodr. tab. 19. S. glutinosa, *Miers, Trav.* ii. 531. S. straminea, *Hook. Exot. Fl.* p. 229. S. picta, *Sweet, Br. Fl. Gard.* tab. 258; *Hook. Bot. Mag.* tab. 3365;—omnino viscoso-pubescens, foliis inferioribus laxis, lanceolatis, acute pinnatifido-incisis, superioribus breviter petiolatis, inciso-dentatis, laciniis acutis, floralibus sessilibus, linearibus, integris, bracteiformibus; corolla lineis violaceis picta, tubo lutescente, limbo stramineo.—Chile, ora littorali, *in herb. Hook.* (*Gillies, Mathews, Cuming, Bridges*).

This plant, well known in our gardens, grows to the height of 2 or 3 feet. Its leaves are of more delicate texture, always longer, narrower, and more deeply incised into acute segments than in the following species: they are 5 inches long, including the petiole, on which they are decurrent, and $1\frac{1}{4}$ inch broad, or 7 lines across at the base of the incisures. I observe a note upon my drawings, stating that in this species, the two lower stamens, between which the sterile one is situated, form the longest pair, while in *S. purpurea* the same stamens form the shorter pair, and I have found this in the dried specimens I have examined, but I cannot at this distance of time assert it to be a fact of constant occurrence.

2. *Salpiglossis purpurea,* Miers, Trav. ii. p. 531;—viscoso-pubescens, foliis radicalibus confertis, elliptico-oblongis, apice obtusiusculis, imo in petiolum elongatum cuneatis, margine grosse et obtuse dentatis, crassis, caulinis integrioribus, lanceolatis, obtusis, petiolo abbreviato, floralibus linearibus, sessilibus, bracteiformibus; corolla tubo purpureo, limbo violaceo, reticulatim picta.—In Andibus Chilensibus, *v. s. in herb. Hook., Gillies* (S. andicola, MSS.).

Var. *β. atropurpurea,* Graham. Corolla reticulatim nigro-picta, limbo profunde purpureo. *Cuming.*

This plant seldom exceeds a height of 15 or 18 inches: it has a stronger and more woody stem, and may easily be distinguished

from the former species by its radical leaves, which are of thicker texture, broader in proportion, shorter and more elliptic, with short obtuse teeth, and not deeply divided with acute incisures, as in *S. picta*: the radical leaves, including the attenuated petiole, are $3\frac{1}{4}$ inches in length, the limb being $2\frac{1}{2}$ inches long and 11 lines broad.

Pteroglossis.

Among the very curious and interesting plants collected by Bridges in the vicinity of Coquimbo, is one that will constitute a new genus, near *Salpiglossis*. It is a plant with pinnatifid leaves, only in a few of the lower axils, those above being reduced to a linear form; its ascending stems are widely diffuse in many spreading dichotomous branchlets, which are very slender and terete; the leaves at each axil are gradually diminished to the size of very short linear bracts, which support a few solitary one-flowered peduncles. The corolla, though smaller, has much the shape of that of *Salpiglossis*, with didynamous included stamens, and it possesses the peculiar æstivation of the *Salpiglossideæ*. The most remarkable feature consists in the unusually broad expansion of its stigma, which hoods the lower pair of stamens, somewhat after the manner of *Nierembergia*, its winged appendages being quite membranaceous, decurrent for some length upon the style, and marked with numerous parallel radiating nervures, which terminate in its lacerated or crenulate margins. The name above proposed is derived from *πτερὸν, ala*, and *γλῶσσα, lingua*, because of its broadly winged stigma.

Pteroglossis (gen. nov.).—*Calyx* tubulosus, subcylindricus, breviter 5-dentatus, 10-nervis, dentibus acutis. *Corolla* infundibuliformis, tubo imo coarctato, hinc ventricoso, 15-striato, limbo expanso, inæqualiter 5-lobo, sub-bilabiato, lobis omnibus emarginatis, superiori longiori et latiori, æstivatione reciprocativa*. *Stamina* 4, didynama, inclusa, postica longiora; *filamenta* dilatata, apice angustata. *Antheræ* ovatæ, 2-lobæ, imo divaricatæ, apice sine connectivo in sinu apicifixæ, rima marginali dehiscentes. *Ovarium* disco carnoso sub 2-lobo impositum, stipitatum, 2-loculare, placentis centralibus dissepimento adnatis, multiovulatis. *Stylus* apice dilatatus, inflexus. *Stigma* bialatum, emarginatum, superne carinatum, infra planum, glandula viscoso in sinu notatum, alis latis, membranaceis, in stylum longe decurrentibus, radiatim nervosis, margine sublaceratis, staminibus inferioribus amplectentibus. *Capsula* calyce persistente tecta, 2-locularis, 2-valvis,

* *Huj. op.* vol. i. p. 172.

valvis semibifidis, placenta centrali demum solutis. *Semina* ignota.—Planta *Chilensis subglabra*, radice *lignosa perenni*, caulibus *plurimis adscendentibus, gracilibus, laxis, divaricatim ramosis*; folia *alterna, inferioribus sinuato-pinnatifidis*; pedunculi *uniflori, axillares, paniculam laxam efformantes.*

1. *Pteroglossis laxa*;—subglabra, ramosissima, ramis plurimis, teretibus, gracilibus, laxe divaricatis, nodis distantibus; foliis axillaribus, inferioribus oblongis, sinuato-pinnatifidis, in petiolum spathulatis, sub lente minutissime pubescentibus, mediis linearibus, supremis floriferis in bracteis parvis decrescentibus: pedunculis solitariis, viscoso-pubescentibus, unifloris; floribus parvulis; corolla straminea, lineis violaceis picta.—Coquimbo, *in herb. Hook.* (*Bridges, no.* 1839).

This plant has very much the habit of *Schwenkia americana*: the root is ligneous, as well as a short perennial woody stump, from which arise several somewhat erect branches 12 to 18 inches long, which are evidently deciduous; these are slender, terete, glabrous, flexuosely brachiate at each axil, and again dichotomously branched: below, the axils are more approximate, above widely distant. The lower leaves are sinuato-pinnatifid, about 1 to $1\frac{1}{4}$ inch long including the petiole, and 3 lines broad including the segments; to the naked eye they appear quite smooth, but under the lens they are seen to be invested by numerous, very short, minute hairs: these leaves gradually diminish to the size of $\frac{3}{4}$ to 1 inch long and only half a line broad, and as they ascend they become smaller, till they arrive at the terminal floriferous branchlets, where they assume the form of linear bracts, scarcely a line in length and $\frac{1}{8}$th of a line broad; from each of these springs a very slender glandular pubescent peduncle, about half an inch in length, bearing a solitary flower; the calyx is $1\frac{1}{2}$ line long, tubular, and crowned by five equal fleshy erect teeth; the corolla is about 4 lines long, of a yellowish colour, marked by about fifteen violet-coloured, parallel, branching lines; the tube is contracted and cylindrical below for one-third of its length, above this it is ventricose, with a border of five, oblong, rounded and emarginate patent lobes, the upper one of which is somewhat longer and broader; they assume in æstivation that peculiar mode of plication which I have called reciprocative (*loc. cit.* 172); the didynamous stamens are included, arising from the contracted portion of the tube; the ovarium is oblong, 2-grooved, imbedded in a fleshy 2-lobed cup borne upon a short stipitate support, and surrounded by the induvial remains of the corolla; the style is slender, the length of the stamens, inflexed at its apex, and gradually widening consi-

derably by the broad decurrent wings of the stigma, which hood the anthers of the somewhat shorter pair of stamens : the stigma is broad, membranaceous, deeply emarginate at its apex, constituting two distinct rounded wings, marked by numerous radiating nervures ; it forms altogether a galeate head, flattened on the under side and keeled on the upper surface by the prominent sharp margin of the style, which carinated edge is terminated in the sinus by a viscous globular gland. The capsule is small, consisting of two bifid valves, parallel to the dissepiment, and inclosed by the persistent calyx. I had no opportunity of examining its seeds *.

Leptoglossis.

This genus was founded by Mr. Bentham, in the 'Botany' of the Voyage of the Sulphur, for a Peruvian plant, which has not yet been figured, nor have the details of its structure been hitherto delineated or minutely examined. It possesses much the habit of a *Browallia*, to which it offers some resemblance in the form of its corolla ; but it differs from that genus in having a fifth sterile stamen and in the shape of its stigma, which is intermediate between that of *Pteroglossis* and of *Salpiglossis* or *Nierembergia*. No opportunity had presented itself for examining the æstivation of the corolla of *Leptoglossis* when I offered the remarks upon the tribe of the *Salpiglossideæ huj. op.* vol. i. p. 173) ; but recent observation has enabled me to state that it is decidedly imbricative, and as far as can be judged from well-macerated dried specimens, it is apparently of that modification which I have called replicative (*loc. cit.* 173), the postical lobe being altogether interior, as in *Nierembergia* and *Petunia*. The alliance of *Leptoglossis* is clearly with the two latter genera, agreeing with the former in its small lanceolate leaves, its calyx, its slender tubular corolla, in the dilatation of its stigma, in the long stipitate support of the ovarium, in its persistent hypogynous glands, and in its stipitate capsule. With the latter genus it agrees in the obliquity of the border of its corolla, and the somewhat palate-like enlargement of the tube below the throat. The position of *Leptoglossis* is manifestly among the *Petunieæ*, and not in the *Salpiglossideæ*, as suggested in the tabular arrangement (*loc. cit.* p. 165). It appears to me to hold no relation whatever to *Schwenkia*.

The following generic character has been made, after a careful analysis of the plant referred to :—

Leptoglossis, Bth. non D.C. Char. emend.—*Calyx* brevis, tubulosus, nervis 15 in seriebus 5 ternariis pressius ordinatis,

* This plant, with its analytical details, is shown in plate 52 of this volume.

interstitiis eveniis membranaceis, 5-anguloso-sulcatus, 5-dentatus, dentibus acutis linearibus callo-mucronatis. *Corolla* tubularis, elongata, tubo imo carnosulo 5-sulcato constricta, medio subcylindrica, in faucem antice breviter ventricosa, limbo obliquo, 5-lobo, lobis suborbicularibus, 2 anticis minoribus reflexis, postico erectiusculo, æstivatione imbricata, verisimiliter replicativa. *Stamina* 5, inæqualia, inclusa, quorum 4 didynama, cum quinto sterili ; *filamenta* subdilatata, tenuissima, posticorum e coarctatione tubi orta, anticorum dimidio breviora medio corollæ inserta, sterili sub-breviore intermedio ; *antheræ* in faucem conniventes, stigmate deflexo circumplexæ, 2-lobæ, in sinu apicifixæ, lobis basi divaricatis, apice sine connectivo connatis, et rima marginali bivalvatim transverse hiantibus ; posticorum dimidio minore ; sterili oblonga, cassa, erecta. *Pollen* simplex, globosum, 3-sulcatum. *Ovarium* oblongum, conicum, longiuscule stipitatum, glandulis 5, carnosis, coloratis, subliberis, rotundatis, summo stipitis connatis, et discum hypogynum cupuliformem persistentem fingentibus, 2-loculare, placentis centralibus, multiovulatis, dissepimento utrinque adnatis. *Stylus* tenuis, inclusus, apice incurvatus, compressus, valde dilatatus. *Stigma* emarginato-2-labiatum, lobis latissimis, brevibus, truncatis, intus incrassatis et viscoso-glandulosis, inferne longe auriculatis et membranaceis, antheras amplectentibus. *Capsula* calyce persistente tecta, 2-locularis, septicide 2-valvis, valvis semibifidis, placenta centrali demum solutis. *Semina* plurima, parva, reticulato-favosa ; cetera ignota.—Herba *Peruviana viscoso-pubescens* ; folia *alterna, parva, sessilia, lanceolata, integra* ; cymæ *plurimæ, alternæ, terminales, ex axillis foliorum superiorum lateraliter ortæ, longe et patentim pedunculatæ* ; flores *parvuli, pedicellati, conferti* ; corolla *albida*.

1. *Leptoglossis Schwenkioides*, Bth. Voy. Sulph. 143 ;—undique viscoso-pubescens ; foliis lineari-lanceolatis, acutis, 1-nerviis, apice callosis, sessilibus, in turionibus sæpe fasciculatis, superioribus decrescentibus ; corolla tenui, glabra, intus imo retrorsim pilosa.—Peruvia, *v. s. in herb. Hook.* (Huamantango, *Barclay* ; Peru, *Mathews, no.* 1011 ; *Cuming, no.* 1010).

This plant has very much the habit of some of the small-leaved species of *Petunia* ; its branches are virgate, the leaves 6 to 9 lines long, 1 to $1\frac{1}{2}$ line broad ; the floral branchlets are about 1 inch long, generally with three to five flowers at the extremity of each ; the pedicels are very short ; the calyx 2 lines in flower, 3 lines in fruit ; the tube of the corolla is 8–9 lines in length, 1 line broad, the border 3–4 lines in diameter ; the capsule is 2 lines long *.

* A figure of this species, with sectional details, is given in plate 53 of this work.

Browallia.

The affinity of *Browallia* with *Salpiglossis* is sufficiently evident, but in many respects it approaches very closely to *Petunia*. In the tabular arrangement suggested on a former occasion (*huj. op.* vol. i. p. 172), *Browallia* was associated with the *Salpiglossideæ*, on account of the apparent æstivation of its corolla, combined with its other characters. I regret very much, that since my attention has been directed to this investigation, I have had no opportunity of examining a flower in its living state, as by this means only could its precise mode of præfloration be ascertained: it is certainly not imbricative as in *Franciscea*, but is either replicative or reciprocative, as in *Petunia* or *Salpiglossis*; judging from its appearance after being pressed and dried, it seems to be rather that of the last-named genus. The following generic features have been derived wholly from an examination of dried specimens:—

Browallia, Linn. (char. reform.).—*Calyx* tubulosus, subcylindricus, 10-nervis, 5-dentatus, dentibus inæqualibus, 3-nerviis, augescens et persistens. *Corolla* hypocraterimorpha, tubo angusto, cylindrico, calyce 2–3-plo longiore, superne et antice ventricoso, fauce in oram elevatam constricto, limbo obliquo, plano, breviter 5-partito, lobis rotundatis, emarginatis, inæqualibus, rarius oblongis, acutis, antico paulo majore, æstivatione reciprocativa? *Stamina* 4, didynama, inclusa; *filamenta* brevia, 2 antica inferiora, sublongiora, hemicyclice curvata, imo dilatata, apice expansa, inflexa et pilosa; *antheræ* sagittato-bilobæ, inversæ, lobis ovatis, rima marginali dehiscentibus, superiorum lobo altero minimo casso. *Ovarium* obovatum, apice pilosum, inferne glaberrimum, sæpe stipitatum, rarius omnino glabrum, 2-loculare, placentis carnosis prominulis dissepimento utrinque adnatis, multi-ovulatis. *Stylus* simplex, apice incrassatus, inflexus, transversim rugulosus. *Stigma* dilatato-bilobum, lobis emarginatis altero majore, intus septis cruciatim in locellis 4 stigmatosis divisum. *Capsula* membranacea, calyce persistente tecta, 2-locularis, 2-valvis, valvis bifidis, dissepimento tenuissimo demum libero parallelis. *Semina* plurima, minuta, obovata, lateribus angulata, dorso convexa, ventre concava et infra medium hilo notata; testa reticulato-foveolata. *Embryo* in axi albuminis carnosi homotrope subincurvus, cotyledonibus ovatis, compressis, radicula tereti infera 3-plo brevioribus et 2-plo latioribus.—Herbæ *Americæ intertropicæ indigenæ, plus minusve viscido-pubescentes*. Folia *alterna, integra*. Flores *ad axillas foliorum superiorum solitarii, cum petiolis sublateralibus, interdum foliorum minutione in cymas irregulares termi-*

nalibus dispositi; pedunculo *florifero brevi, interdum fructifero mox elongato*; corolla *violacea, cærulescens, aut albescens.*

In addition to the species enumerated by Mr. Bentham in DC. Prodr. x. 197 et 590, and the *B. speciosa* of Sir Wm. Hooker, Bot. Mag. tab. 4339, I have now to mention two others yet undescribed:—

Browallia tenella (n. sp.);—herbacea, humilis, parce puberula, foliis membranaceis, lanceolatis, vel ellipticis, in petiolum elongatum cuneatis; floribus paucis, solitariis, axillaribus, calycis membranacei dentibus lanceolatis, obtusis, inæqualibus; corollæ tubo gracili, calyce 4-plo longiore, limbo brevi, plano, sinuato-pentangulato, lobis brevissimis, emarginatis, rotundatis, antico majori; ovario apice piloso.—Rio de Janeiro.

This species, which I found growing at Pertininguy in 1830, has very much the habit of *B. demissa*, but is readily distinguished by the much greater length of the petiole, fewer flowers, a more slender corolla with a much narrower border, a more membranaceous calyx with less prominent nervures, and by the simple hairs and almost obsolete pubescence of the whole plant. It is remarkable as being the first instance of any species growing so far to the southward of the equator and upon the eastern side of the continent. It is scarcely more than 6 or 8 inches high, with a very slender and almost glabrous stem, but little branched; its leaves are $1\frac{1}{4}$ inch long, $\frac{3}{4}$ inch wide, upon a very slender filiform petiole of $\frac{3}{4}$ inch; the peduncle of the flower is barely 2 lines long, growing to a length of 7 lines; the tube of the calyx is 2 lines long, with teeth scarcely a line in length; it is cylindrical, $\frac{3}{4}$ line in diameter, growing to a length of 4 lines in fruit and a diameter of 2 lines, wholly enclosing the capsule; the tube of the corolla is very slender, 8 lines in length, of a greenish lurid white; the border is 4 lines in diameter, at first of a pale bluish colour, afterwards becoming of a violet hue. The internal structure of the flower, capsule and seeds entirely agrees with that of the typical species*.

Browallia nervosa, n. sp.;—foliis ellipticis, acutis, in petiolum longiusculum canaliculatum attenuatis, ciliatis, utrinque sparsim scabrido-pilosulis, penninerviis, nervis subtus prominulis, floriferis fere bracteiformibus; floribus axillaribus laxe subracemosis; calyce parvulo, angustato, cylindrico, dentibus acutis, erectis, ciliatis, nervis 10 violaceis picto, glabro; corolla hypocraterimorpha, tubo angusto, calyce 2-plo longiore, limbo

* A figure of this species with generic details is shown in plate 54 of this work.

lato, plano, violaceo, lobis brevibus emarginatis; ovario obovato, apice piloso.—Ecuador, *v. s. in herb. Hooker.* (Villa Sasaranga, prope Loxam). *Seemann, no.* 740.

This plant is intermediate with *B. peduncularis* and *B. grandiflora,* from both of which it is evidently distinguished by the remarkably contracted form of its calyx and peduncle. It differs also from *B. demissa* by its leaves being more acute at their base, with a comparatively longer and more winged petiole, and by its more racemose flowers. The leaves are $1\frac{1}{4}$ inch long, 8 lines broad, on a petiole half an inch in length, with the coriaceous texture and general appearance of those of *B. peduncularis.* The calyx, having five short pointed erect teeth, is at first extremely narrow, 4 lines long, $\frac{3}{4}$ line in diameter, swelling to a much larger size in fruit; the tube of the corolla is 8 lines long, $\frac{1}{2}$ line in diameter, slightly swollen below the very narrow mouth; the border is large in proportion, quite plane and rotate, 9 lines in diameter, and of a purple colour; the capsule, 3 or 4 lines long, is hairy at the summit of its bifid valves.

It appears desirable to divide the species of *Browallia* into two sections; the first including those whose corolla presents a plane border, with short emarginate lobes, and an ovarium with its upper moiety densely covered with long white hairs, which are even persistent on the capsule; the second will comprise such as do not possess these characters, and is confined at present to a single species: thus—

§ 1. Eubrowallia. Corollæ limbus planus, rotatus, lobis brevibus, emarginatis; ovarium cuneatum, apice obtusum, et dense pilosum.

1. *Browallia demissa,* Linn., DC. Prodr. x. 197.
2. ——— *viscosa,* H. B. K. ii. 373.
3. ——— *tenella,* n. sp. supra descript.
4. ——— *nervosa,* n. sp. ibid.
5. ——— *peduncularis,* Bth., DC. Prodr. x. 197.
6. ——— *grandiflora,* Grah. ibid.
7. ——— *abbreviata,* Bth. ibid.

§ 2. Leiogyne. Corollæ limbus profunde incisus, laciniis oblongis, acuminatis, 3-nerviis; ovarium subglobosum, sessile, omnino glaberrimum.

8. *Browallia speciosa,* Hook. Bot. Mag. tab. 4339. The much larger flowers of this species, its more acutely-lobed and deeper-cleft border, and constantly smooth ovarium, are characters of hardly sufficient importance to constitute a generic difference; but at all events, with such marked distinctions, *Leiogyne* will form a good subgenus.

From the above enumeration *B. Jamesoni* has been excluded, because it differs in its characters, in the number of divisions of its calyx, in the shape of its corolla, the form and position of its stamens, and the structure of its stigma.

Streptosolen.

I have already alluded to the propriety of excluding from *Browallia* the species described under the name of *B. Jamesoni*, as it possesses many essential characters at variance with that genus. All the species of *Browallia* are herbaceous, while the plant above-mentioned is suffruticose, forming a branching shrub 4 or 6 feet high, with very rugous, coriaceous and scabrid leaves; the inflorescence is also more corymbose, and the structure of the flower differs from that of *Browallia* in the following particulars. The calycine tube is crowned with four, rarely with five teeth; the corolla is not hypocrateriform, and its tube, instead of being slender and cylindrical, swells into a funnel-shape, immediately as it emerges from the calyx, and the contracted basal portion soon twists half a revolution, so that the border becomes actually resupinate; owing to the want of the contraction in the throat, the border does not assume the figure of a rotate 5-lobed plane, but enlarges more in a campanular form with five short rounded lobes, the front lobe being broadest; it is however often 4-lobed by the confluence of the two upper smaller segments; the two lower stamens are not short, dilated, hemicyclical, and fixed in a ventricose swelling below the throat, but are here straight, slender and filiform, originating in the contracted base of the funnel-shaped tube and opposite the broader lobe of the border; the two upper filaments are also straight and nearly erect, although they are fixed in the mouth of the campanulate border, with one of the lobes of each anther almost abortive or dwarfish, as in *Browallia*; all the filaments are terete, not greatly dilated, and although at first hairy, they become at last quite glabrous. The style resembles that of *Browallia* in being swollen at its summit, where it is hollow and corrugated into numerous transverse folds; but the stigma is of an essentially different form, being suddenly expanded into two broad, compressed, auriculate, equal lobes, at first connivent, afterwards ringent, with a large opening in the sinus into the tubular summit of the style (and which in the living state is probably filled with mucous matter), thus approaching more to the form of the stigma of *Petunia*. The whole plant possesses much the habit of *Stemodia suffruticosa*, with which genus and with *Pterostigma* there exists some analogy in the form of the stamens and stigma. It will however constitute a genus belonging to the tribe *Petunieæ*, connecting this group still more closely with the *Salpiglossideæ* by *Browallia*.

The name now proposed for this genus is derived from στρεπτὸς, *tortus*, σωλὴν, *tubus*, because of the torsion of the lower portion of the tube of the corolla.

STREPTOSOLEN (gen. nov.).—*Calyx* tubulosus, 4–5-nervis, reticulatus, 4–5-dentatus, dentibus inæqualibus, persistens. *Corolla* infundibuliformi-tubulosa, subcurvula, limbo campanulato, subobliquo, brevissime 5-lobo, lobis apiculatis aut emarginatis, antico paulo latiore, tubi torsione mox resupinato, æstivatione replicativa. *Stamina* 4, didynama, inclusa, valde inæqualia, 2 inferiora (in alabastri antica) imo tubi orta, 2 superiora brevissima fauce inserta; *filamenta* teretia, recta, pilosa, mox glabra; *antheræ* 2-lobæ, subdeclinatæ, lobis ovatis, imo late divaricatis, margine dehiscentibus, singulo receptaculo pollinifero globoso intus instructo, superiorum lobo altero minimo casso. *Ovarium* ovatum, disco glanduloso stipitato imo cinctum, apice parce pilosum, demum glabrum, 2-loculare, placentis carnosis dissepimento adnatis, multiovulatis. *Stylus* filiformis, apice incrassatus, subincurvus, tubulosus, et transverse rugoso-crenulatus. *Stigma* valde dilatatum, imo late cordatum, 2-labiatum, lobis æqualibus obtusis conniventibus, mox hiantibus, in sinu cavernosum. *Capsula* ovata, coriacea, calyce tecta, 2-locularis, 2-valvis, valvis 2-fidis, dissepimento libero parallelis. *Semina* plurima *Browalliæ*.—Suffrutices *Nova-Granadenses et Ecuadorenses strigoso-hispidulæ*. Folia *ovata, coriacea, rugosa, aspera, petiolata, florifera ad bracteas redacta*. Flores *pedunculati, terminales, conferti, subcorymbosi*. Corolla *aurantiaca, extus valde pubescens*.

1. *Streptosolen Jamesoni*. Browallia Jamesoni, *Benth.*, *DC. Prodr.* x. 197;—fusco- et scabrido-hispidula, foliis ovatis, utrinque acutis, subcoriaceis, bullato-rugosis, subtus nervis valde prominulis, utrinque scabridis, longiuscule petiolatis, corymbo ampliore, calycis dentibus 4 subæqualibus, acutis, erectis, fusco-viridibus, tubo cylindrico, angustato, medio contracto, concolori: corollæ aurantiacæ tubo infundibuliformi ampliore extus molliter tomentoso, limbi campanulati lobis fere æqualibus, brevissimis, mucronulatis.—Ecuador, *v. s. in herb. Hook.* Loxa, *Hartweg, no.* 818. Sasaranga, prope Loxam, *Seemann, no.* 872.

I have already described in the foregoing page the peculiar habit of this species; the leaves are $1\frac{1}{4}$ inch long, 8 lines broad, on a narrow channeled petiole of 4 lines; above they are deeply furrowed at the nervures with prominent reticulate veins, hispidly pubescent below, scabrido-hispid above, of a very dark green colour, opake and brittle when dried; the peduncles are 4 lines

long; the calyx of equal length is $1\frac{1}{2}$ line in diameter, somewhat contracted in the middle, with almost lanceolate acute erect teeth; the corolla is 1 inch in length, the tube at base only a line in diameter, swelling to a diameter of 4 lines at the mouth, the border being about 8 lines in diameter; externally it is softly pubescent and almost smooth within. The lower pair of stamens have their origin somewhat fornicated, about 2 lines above the base of the tube, opposite the reflexed broader lobe of the border, are about 6 lines in length, quite smooth at base, minutely pubescent above; the upper shorter pair are inserted at 7 lines from the base and below the mouth of the tube, which is here slightly pubescent; they are all stiff and rigid, and want that peculiar arching expansion with long glandular hairs that forms so peculiar a character in *Browallia*. The style is about 7 lines in length, with a broadly expanded stigma, which is quite bilabiate and of a distinctly different form from that of the very remarkable stigma of *Browallia*. The pedicel and calyx do not sensibly enlarge in size; the capsule, which is wholly inclosed within the calyx, is quite smooth, but in other respects like that of *Browallia* and *Petunia**.

2. *Streptosolen Benthami* (an nov. sp. vel præcedentis var. ?);—ramulis griseo-hirsutulis; foliis ovatis, minus rugosis, læte viridibus, nervis supra impressis, utrinque pilosulis, supra vix scabriusculis, breviter petiolatis; floribus subcymosis, pedicellis calyce vix longioribus; calyce subinflato, late tubuloso, ore valde obliquo, tubo pallide viridi, nervis fuscis lineato, dentibus 5, inæqualibus, ovatis, obtusis, cærulescentibus; corollæ limbi lobis brevibus, emarginatis, lobo antico (in alabastro postico) multo majori, subreflexo.—Nova Granada, *v. s. in herb. Hook.* (inter Mivir et Naranjas, altit. 7000 ped., *Jameson*).

I have seen only a single and very meagre specimen of this "small shrub," which has few flowers: the leaves are of the same shape but somewhat smaller than in the foregoing species, much smoother and of a lighter colour; the flower is about the size of that of *S. Jamesoni*; the calyx is however larger, wider, with much broader and more obtuse segments; it increases somewhat in fruit to a length of 6 lines and a diameter of nearly 3 lines, and conceals the capsule, which is about 3 lines long; it has four thick coriaceous valves, is seated upon its stipitate support, and encircled at base by the induvial remains of the corolla.

Brunsfelsia.

Upon a previous occasion (*huj. op.* vol. i. 176) I suggested the propriety of again separating *Franciscea* from *Brunsfelsia*, which

* This species is figured in plate 55.

genera had been united into one, by Mr. Bentham, in his excellent Monograph on the *Scrophulariaceæ* (DeCand. Prodr. x. 198). With the view of carrying out this suggestion, I now offer at greater length the observations on which that recommendation was founded. Although there exists a remarkable similarity in several of their respective features, many essential points of distinction may be observed between them: thus, in *Brunsfelsia*, independently of the constant difference in the yellow colour of the corolla, its tube is always comparatively of much greater length, often ten or twelve times that of the calyx, and in all cases is wider and somewhat funnel-shaped in the mouth; the border too is much broader, of more fleshy consistence, more deeply and unequally lobed, the segments being more or less crenated and crispate and somewhat reflexed; while in *Franciscea* the tube is seldom more than three or four times the length of the calyx, and though suddenly a little inflated above, is again much contracted in the mouth, presenting a conspicuous and prominent rim around its very narrow orifice; the colour of the corolla is constantly of a violet or bluish hue, more or less intense; the lobes of the border are quite flat and rotate, and not at all crispate. The anthers in *Brunsfelsia* are at first 2-celled, with the confluent lobes affixed transversely, thus forming an oblong body grooved across, four times broader than long; this bursts by the upper marginal suture assuming the appearance of being unilocular: it takes a vertical position by the inflection of the filament.

In *Franciscea*, the anther, on the contrary, is always distinctly 1-lobed, 1-celled, almost circular and reniform, fixed at its sinus upon the apex of the filament; it is 2-valved, bursting by a nearly marginal hippocrepiform line, and exhibits in the bottom of the cell a fleshy prominent globular receptacle, to which the pollen-grains are attached, as in *Verbascum*. The stigma is similarly constructed in both genera, as is also the ovarium. In *Franciscea* the fruit is an oval capsule, inclosed within the persistent calyx, and covered with a thick coriaceous pericarp, which in one species almost prevents its dehiscence: in such instances the sutural line is always evident, and by pressure the fruit bursts by these sutures: in most cases, the capsule (which is 2-locular) splits at its apex by four vertical lines: it presents few seeds (about ten) without any intervening pulp. In *Brunsfelsia*, on the contrary, the fruit is a globular deep orange-coloured drupe many times larger than the calyx, about the size of a small apple, with a soft pulpy envelope inclosing a coriaceous putamen, containing many seeds immersed in a fleshy pulp. *Franciscea* grows only to the size of low bushes or small shrubs, while *Brunsfelsia* attains the dimensions of large trees, *B. undulata* being 20 feet

high, and *B. americana* growing to the size of an apple-tree with a trunk as thick as the human body.

Brunsfelsia, Sw. (char. reform.).—*Calyx* brevissimus, urceolatus, profunde 5-dentatus. *Corolla* hypocraterimorpha, carnosa, tubo gracili, cylindrico, calyce 4–12-ies longiore, fauce paulo infundibuliformi, limbo valde expanso, obliquo, ad medium 5-fido, lobis inæqualibus, carnosis, rotundatis, undulato-crispatis, subreflexis, inferiore majori, 2 superioribus minoribus, æstivatione valde imbricatis, maximo exteriori. *Stamina* 4, didynama, inclusa; *filamenta* sursum incrassata et incurva, 2 breviora inferiora et lobo majore opposita: *antheræ* oblongæ, sub-bilobæ, sub-biloculares, lobis transversim latioribus et confluentibus, rima marginali 2-valvatim hiantes, hinc pseudo-1-loculares. *Ovarium* conicum, sessile, glandula basali fere obsoleta, aut nulla, 2-loculare, placentis carnosis, valde prominulis, dissepimento utrinque adnatis, multi-ovulatis. *Stylus* gracilis, filiformis, longitudine tubi corollæ, apice incrassatus, interdum subincurvus. *Stigma* clavatum, 2-labiatum, lobis rotundatis, semi-globosis, glandula magna viscosa prominula interposita. *Drupa* magna globosa, calyce parva patente suffulta, epicarpio carnoso; putamen cartilagineum, indehiscens, rarius in valvulis 2 separabile. *Semina* plurima, ovata, compressa, subreniformia, *testa* tenui fragili, minute scrobiculata, *integumento* membranaceo, angulo basali *chalaza* fusca notato. *Embryo* in albumine carnoso arcuatus, heterotropus, *cotyledonibus* ovatis, compressis, accumbentibus, *radicula* tereti 2-plo latioribus et 3-plo brevioribus.—Arbores *Antillani*, foliis *alternis, integris, oblongis, sæpius nitidis*; floribus *speciosis, solitariis, vel paucis, subcymosis, terminalibus*, corolla *flava vel pallide ochroleuca*.

1. *Brunsfelsia americana*, Sw., DC. Prodr. x. 200.
2. ———— *undulata*, Sw., DC. Prodr. x. 200.
3. ———— *nitida*, Benth., DC. Prodr. x. 201.
4. ———— *violacea*, Lodd. Bot. Cab. t. 792.—Subglabra, foliis lanceolato-ellipticis, utrinque acuminatis, subundulatis, supra glabris, minute punctato-rugosis, subtus pallide glaucis et pube glanduloso-pruinoso vestitis, apice utrinque, costa, nervisque subtus prominulis, rubro-violaceis; floribus subsolitariis, corollæ limbo magno, undulato-crispato, flavo, tubo ochroleuco calyce 12–16-ies longiore.—In Antillis, *v. v. in hort. Kew. cult.*

The leaves of this species are 8 inches long, $2\frac{3}{4}$ inches broad, on a thick and deeply channeled petiole less than half an inch in length. The peduncle is $\frac{1}{2}$ inch long, the calyx $2\frac{1}{2}$ to 3 lines, cleft half-way into five obtuse erect teeth with ciliate margins: the

tube of the corolla is $2\frac{3}{4}$ inches long, 2 lines in diameter, swelling below the mouth to a width of nearly half an inch; the border is much expanded, and is $2\frac{1}{2}$ inches in diameter*.

Franciscea.

Having offered under the preceding head, the reasons that appear to justify the separation of *Franciscea* from *Brunsfelsia*, I now give the amended character of the former, as contrasted with the latter genus.

Franciscea, Pohl. (char. emend.).—*Calyx* inflato-tubulosus, ore obliquo, 5-dentato. *Corolla* hypocraterimorpha, tubo angustato, apice dorso subinflato, fauce in oram valde prominulam obliquam constricto, limbo obliquo, rotato, expanso, ultra medium 5-fido, lobis inæqualibus, rotundatis, integris, superiore maximo, æstivatione quincuncialiter imbricatis, sinubus introflexis. *Stamina* 4, didynama, inclusa, brevia, infra dilatationem tubi per paria inserta, 2 longiora infra lobum maximum et superiorem sita; *filamenta* carnosula, compressa, corrugata, apice inflexa; *antheræ* reniformes, compressæ, sinu affixæ, 1-loculares, rima marginali 2-valvatim hiantes, receptaculo pollinifero globoso in sinu conspicuo. *Ovarium* obovatum, glandulo carnoso stipitato imo cinctum, 2-loculare, placentis carnosis, prominentibus, dissepimento utrinque adnatis, multiovulatis. *Stylus* filiformis, apice valde incrassatus et inflexus. *Stigma* 2-labiatum, lobis brevibus, crassiusculis, obtusis, intus glandulosis. *Capsula* ovata, calyce persistente inclusa, coriacea, 2-valvis, 2-locularis, valvis placenta demum libera parallelis. *Semina* pauca, majuscula, oblonga, subangulata, dorso convexa, hilo ventrali, conspicuo, cavo: testa reticulato-foveolata. *Embryo* hilo contrarius, in axi albuminis carnosi incurvus, cotyledonibus ovatis, compressis, radicula tereti gracili infera triplo brevioribus et 2-plo latioribus.—Suffrutices *Brasilienses et Peruviani*. Folia *alterna, integerrima, oblonga*. Cymæ *terminales, dense capitulæformes vel laxius pauciforæ, rarius ad florem unicum redactæ*; bracteæ *parvæ*: flores *speciosi, violacei, interdum pallidiores, corollæ tubo calyce subæquante, rarius 2–4-plo longiore* †.

1. *Franciscea macrophylla*, Cham. Schl. Linn. ii. 601.
2. ——— *hydrangæformis*, Pohl. Pl. Bras. i. 7. tab. 7.
3. ——— *capitata*. *Brunsfelsia capitata*, Bth., DC. Prodr. x. 198.

* This species with generic details is delineated in plate 56.

† Sectional details showing the characters of this genus are given in plate 59 A.

4. *Franciscea pauciflora*, Cham. Schl. Linn. ii. 600.
5. ——— *Bahiensis*. *Brunsfelsia Bahiensis*, Bth., DC. Prodr. x. 590.
6. ——— *calycina*. *Brunsfelsia calycina*, Bth., DC. Prodr. x. 199.
7. ——— *obovata*. *Brunsfelsia obovata*, Bth., DC. Prodr. x. 199.
8. ——— *confertiflora*, Pohl. Pl. Bras. i. 6. tab. 5. *F. divaricata*, Pohl. ibid. tab. 6.
9. ——— *ramosissima*, Pohl. Pl. Bras. i. 5. tab. 4.
10. ——— *acuminata*, Pohl. Pl. Bras. i. 4. tab. 3.
11. ——— *latifolia*, Pohl. Pl. Bras. i. 3. tab. 2.
12. ——— *grandiflora*. *Brunsfelsia grandiflora*, Don, N. Edin. Phil. Journ. 1829.
13. ——— *maritima*. *Brunsfelsia maritima*, Bth., DC. Prodr. x. 200.
14. ——— *Hopeana*, Hook. Bot. Mag. t. 2829. *F. uniflora*, Pohl. Pl. Bras. i. 2. tab. 1.
15. ——— *australis*. *Brunsfelsia australis*, Bth., DC. Prodr. x. 200.

Margaranthus.

On a former occasion (*huj. vol.* p. 30), although I had not seen any specimen, I noticed this genus in order to contrast it with other allied genera. Since then, I have been glad to meet with a second very distinct species, that has enabled me to comprehend more fully its structural features, and these I find correspond well with the very accurate observations of Prof. Schlechtendal, upon which the generic character (*loc. cit.*) was founded. I proceed therefore to describe the plant alluded to.

1. *Margaranthus tenuis* (n. sp.);—herba glaberrima, dichotome ramosa, ramis divaricatis, tenuibus, angulato-sulcatis; foliis lanceolatis, utrinque acutis, caulinis obsolete pauci-dentatis, longe et tenuissime petiolatis, junioribus floralibus linearibus; floribus pedunculatis, solitariis, axillaribus.—Mexico (*v. s. in herb. Lindley. Coulter, n.* 1220 *bis*).

This plant bears much resemblance to that figured by Prof. Schlechtendal. Its stems however are far more slender, more deeply angular, quite smooth, with internodes about 2 inches apart; the radical leaves may probably be of greater size, but the largest leaves in the specimen referred to, are about $1\frac{3}{4}$ inch long, upon a very slender petiole of $\frac{3}{4}$ inch, and are about 4 lines broad, with four or five somewhat obsolete teeth on the margin. The flowers are seen only in the nascent axils, while the young leaves have not attained the length of 4 lines; the capillary peduncle is

very hairy, and about 2 lines long; the calyx is scarcely a line in length, cylindrical, and is densely covered, especially below the middle, with articulate and rigid white hairs: the corolla is tubular, and contracted at base to the diameter of one-third of a line, but as it emerges from the calyx, it swells suddenly in a somewhat globular form to a diameter of 2 lines, marked with five grooves opposite the stamens, and five intermediate saccate projections, which are below the five minute short teeth, that crown the suddenly contracted mouth of the corolla, which is here even narrower than the inferior portion of the tube; it is entirely smooth and apparently of a lurid white, the saccate lobes seeming of a dull violet hue; outside it is smooth, inside somewhat hairy; the stamens, nearly the length of the corolla, are wholly included, the filaments being very short, smooth, somewhat arcuate, and inserted into the basal contraction of the tube; the anthers are four times the length of the filaments, linear, with two narrow cells, fixed along their whole length, upon a narrow dorsal connective which forms an extension of the filament; the cells burst by a longitudinal line in front, and also by an apical pore, for the external valves are there reflected on each side. The ovarium is small, obovate, superior, and fixed upon a somewhat two-lobed annular gland; the style is exserted beyond the mouth of the corolla, is smooth, somewhat subulate, and truncated at its apex by a small stigmatic pore. The matured fruit, in consequence of the apparently quick growth of the plant, is found only in the dichotomy of the branches, where the peduncle is from 2 to 3 lines long: the calyx is now become greatly enlarged, having acquired a globular form, 4 lines in diameter, very finely reticulated, and contracted in the mouth, which is closed by a very small five-toothed orifice; the included berry is globular, $2\frac{1}{2}$ lines in diameter, with a very thin membranaceous pericarp, apparently without pulp, and probably once filled with an aqueous juice; it is two-celled, and contains about fourteen seeds, which are of a large size compared with the smallness of the berry; these are flat, thin, nearly oval, reniform; the testa is scrobiculate and brittle; the horny and rather translucent albumen incloses a somewhat spiral filiform embryo, in which the radicle (at least three times the length of the cotyledon of equal diameter) points towards the basal angle of the seed below the hilum, which is seen in the marginal sinus*.

Leucophyllum.

This genus was first published and figured in the 'Plantæ Æquinoctiales,' and Bonpland in his observations upon it re-

* A figure of this species and its analytical details are given in plate 57.

marks, that although it appears to belong to *Scrophulariaceæ*, on account of its didynamous stamens, it bears in its habit more the aspect of the *Solanaceæ*, and from this circumstance, the specific name of *L. ambiguum* was evidently given to the species he described.

Professor Kunth, in his 'Nov. Gen. et Sp.' ii. p. 360, observes, that this genus may be considered as nearly allied to *Maurandia* and *Antirrhinum molle*, but I cannot perceive any such analogy. Dr. Lindley, in his 'Nat. Syst. Bot.' p. 292, placed this genus in *Scrophulariaceæ*, among the tribe *Veronicæ*, and Dr. Endlicher in his 'Gen. Plant.' follows this example; lastly, Mr. Bentham in his admirable monograph of this order arranges it in his tribe *Gratioleæ*, and his subtribe *Aptosimeæ* (DC. Prod. x. 344). After a careful examination of the structure of this genus, I have come to a very different conclusion, and hope to show, by good evidence, that its true place is near *Atropa* and *Lycium*, and therefore not among the *Scrophulariaceæ*. The structure of the corolla in *Leucophyllum* precisely corresponds with that of *Atropa*, having a campanulate tube, with a small border slightly oblique, of five nearly equal rounded lobes, which are imbricately disposed in æstivation, and five somewhat unequal stamens, two being always shorter; and it sometimes happens that the anthers of one of the three other stamens are abortive, or the fifth stamen altogether wanting; and such is the state, I conclude, of the species described by Bonpland, as I have noticed in Hartweg's specimen, although, in Galeotti's plant of *L. ambiguum*, I have found the flowers to be always pentandrous, as in *L. campanulatum*. All the species of *Leucophyllum* resemble *Lycium* in their fruticose habit, with solitary, axillary, violet-coloured flowers, and one species has an evident tendency to become spinous, like this last-mentioned genus. Had *Leucophyllum* possessed a baccate fruit, its position would unquestionably have been between *Atropa* and *Lycium*; but as it is capsular, it will fall into a new tribe, which may be called *Leucophylleæ*, that will stand between the *Hyoscyameæ* and *Atropeæ* (*huj. op. vol.* i. 166). The following is an outline of its generic features:—

Leucophyllum, Bonpl. (char. reform.).—*Calyx* parvus, profunde 5-fidus, laciniis æqualibus, lanceolatis, erectis. *Corolla* campanulata, tubo amplo infundibuliformi, limbo 5-fido, subbilabiato, lobis fere æqualibus, antico subminori reflexo, 2 posticis erectiusculis, omnibus oblongis, obtusis, æstivatione imbricatis. *Stamina* 5, inæqualia, inclusa, corollæ dimidio longitudine, 2 antica breviora, quinto interdum rudimentario, rarius omnino deficiente; *filamenta* imo tubi affixa, glabra, basi crassiuscula, apice subdeclinata; *antheræ* sagittato-bilobæ, lobis apice nexis, longitudinaliter intus dehiscentibus, quinti inter-

dum minimæ, aut abortivæ. *Ovarium* oblongum, glandula annulari fere obsoleta imo cinctum, 2-loculare, *ovulis* plurimis, dissepimento medio prominulo et incrassato utrinque adnatis. *Stylus* erectus, filiformis, apice declinatus, longitudine staminum. *Stigma* breviter bilabiatum, lobis adpressis. *Capsula* ovata, coriacea, calyce persistente cincta, septicide dehiscens, valvulis apice 2-fidis, marginibus introflexis, imo basi columnæ subglobosæ placentiferæ adhærentibus. *Semina* plurima, minuta, transversa, oblonga, compressa, dorso plana, quadrato-angulata, longitudinaliter curvata, striato-rugulosa, hilo ventrali et fere basali. *Embryo* in *albumine* carnoso oblongus, curvatus, subcompressus, *cotyledonibus* oblongis, *radicula* basali tereti vix latioribus, et 2-plo longioribus.—Suffrutices *Mexicani, pube brachiato densissime tomentoso vestiti*; folia *alterna, subparva, crassa, uninervia, breviter petiolata*; flores *solitarii, axillares, folio subæquales, breviter pedunculati, corollæ tubo calyce* 2–3-*plo-ve longiore.*

1. *Leucophyllum ambiguum*, Humb., Bonpl. Pl. Æquin. ii. 95. tab. 109; H. B. K. ii. 361;—foliis ovatis, basi apiceque acutiusculis, utrinque densissime tomentosis, cinerascentibus, junioribus pallide incanis; laciniis calycinis lineari-lanceolatis, extus tomentosis, intus glabris, nitidis, 3-nerviis, corollæ tubo amplo 3-plo brevioribus; ovarii apice, stylique basi pilosis.—Mexico. Actopan, Prov. Mexico, alt. 6600 ped., *Bonpland.* Atotonilco el Grande, Prov. Durango, *Hartweg*, n. 357. Zimapan, *Galeotti*, n. 7210.

This is described by Bonpland as a tall shrub, 8 to 15 feet in height, with a stem slightly tortuous, 4 or 6 inches in diameter, covered with a slightly rent bark. It is a very conspicuous object in the forests, showing itself at a distance by its silvery leaves, and forming a striking contrast with the dark green foliage of the surrounding trees. Its leaves are from $\frac{1}{2}$ to $\frac{3}{4}$ inch long, 5 or 6 lines broad, with a petiole 2 lines in length; its calyx measures 2 or 3 lines, and is smooth within; its violet-coloured corolla is $\frac{1}{2}$ an inch long, smooth outside and pilose within. This species may readily be distinguished from the others, by its leaves being acute at both ends; in the older ones the tomentum is of a blackish gray, in the younger leaves of a pale yellowish white; the small branchlets are 4 to 8 inches long, almost bare, prominently knotty at the articulation of the fallen petioles, with only a few leaves towards the extremity, and with solitary flowers in their axils. Bonpland describes the stamens to be didynamous, quite glabrous, and the upper lobe of the corolla woolly within, and the tube pilose inside to the insertion of the stamens. Kunth, who probably examined very imperfect specimens, says, on the

contrary, that it is quite smooth within, and that it has a convex palate marked with orange-coloured glandular spots, but I can perceive no indication of such a palate. In the above-mentioned specimens, the calycine segments are smooth within; the corolla is also smooth, and hairy only in the mouth and upon the lobes of the border. Galeotti's specimen, as I have before observed, has distinctly five fertile stamens, Hartweg's has only four.

2. *Leucophyllum Texanum*, Benth., DC. Prodr. x. 344;—ramis glabris, tortuosis, nodosis, subspinescentibus, junioribus tomentosis; foliis obovato-oblongis, apice rotundatis, utrinque cano-tomentosis; calyce extus tomentoso, laciniis lato-lanceolatis, intus pubescentibus et 3-nerviis; corolla præcedentis, staminibus 4 didynamis, cum quinti rudimento, filamentis complanatis, lævibus: capsula apice pilosa.—Mexico, Prov. Texana, *v. s. in herb. Hook.* (Laredo, *Berlandier*.)

In this species the branchlets are more glabrous, more tortuous, and more knotty at the axils of the fallen leaves, often spinous at the short abortive branchlets, the leaves more obovate-oblong and rounded at the apex, the younger leaves incanous, not ferruginous, the calycine segments more oblong and broader; the leaves are 7 or 8 lines long, 4 or 5 lines broad, the petiole being scarcely appreciable; the calyx is $1\frac{1}{2}$ line in length; the corolla, including the lobes of the border, is $\frac{1}{2}$ inch long: the calyx, though persistent, does not increase in size in fruit; the capsule is small, ovate, $1\frac{1}{2}$ line long, the two valves being inflected at the margin, very thick and coriaceous, and bifid nearly to the base.

3. *Leucophyllum campanulatum* (n. sp.);—ramis substrictis, ramulis abbreviatis, approximatis; foliis ovato-orbicularibus, crassis, utrinque densissime tomentosis, adultis incanis, junioribus confertissimis, ferrugineis; floribus axillaribus ideo arctis, folio superantibus, calycis laciniis crassis, lanceolatis, apice obtusiusculis; corolla præcedentibus dimidio majore, glabra, intus simpliciter hirta, ovarii apice, stylique basi, dense pilosis.—Mexico, *v. s. in herb. Lindl. et Hook.* (Zimapan, Prov. Mex., *Coulter, n.* 1271).

This species is very distinct from the two former, its leaves being more orbicular, 8 lines long, 7 lines broad, on a channeled petiole 2 lines in length, the older ones being always incano-velutinous, the younger of a deep ochreous colour; the branchlets are very much crowded, and not longer than 1 or 2 inches; the axils much closer, with more copious foliage, hence the flowers appear densely crowded: the corolla is of a deep violet-blue, 7 or 8 lines in length, broader in proportion; its border is somewhat oblique, with five rounded lobes, the anterior one more reflected,

the two posterior lobes more erect; it is nearly smooth outside, and very pilose within. Another characteristic feature is, that the upper moiety of the ovarium, and the lower portion of the style, are densely covered with white hairs, the basal gland being smooth; it has constantly five stamens, of which the three anterior are somewhat shorter. The hairs of the corolla and pistillum are simple and articulated, those of the calyx stellately plumose, as in the rest of the plant*.

Habrothamnus.

I take this opportunity of cancelling the suggestion made on a former occasion, in regard to the validity of this genus (Lond. Jo. Bot. v. 151; and Ill. So. Am. Pl. i. 75). From an examination of dried specimens, I could detect no difference in its floral structure from that of *Cestrum*, upon which a generic distinction could be drawn, and there seemed no other alternative, but to unite the whole group, as a separate section of *Cestrum*. I have, however, lately had an opportunity of examining a plant of this genus in a living state, and can here detect some slight differences, which are not distinguishable in dried specimens. In *Cestrum*, the æstivation of the corolla is induplicato-valvate, the edges of each lobe being partly turned in upon both margins, and closely applied and adherent to those of the contiguous lobes (see Lond. Journ. Bot. vii. 58; and Ill. South Amer. Plants, i. 126): but in *Habrothamnus*, each lobe has its margins completely turned in, so that they adhere, in a somewhat conduplicate form, firmly to one another, and are only connected with those of the adjoining lobes by apposition, not by adhesion; although the margins of the several lobes thus all converge towards the axis, each lobe is respectively free, and not valvately or induplicately connected with the adjoining lobes, as in *Cestrum*; this peculiar mode of æstivation, which is only a modification of the plicative or valvate, so peculiar a feature among the *Solanaceæ*, I propose to distinguish by the name of *implicative*; it is somewhat analogous to the volutive form of *Anthocercis*, a figure of which is shown in 'Ill. South Amer. Plants, i. 170,' but there the margins are respectively imbricated or overlapped, which is one of the principal distinguishing features of the *Atropaceæ* in the Solanal alliance. Another difference is observable in the structure of the stigma, which is not exactly that of *Cestrum*. In *Habrothamnus*, the style is a little thickened at its summit, and slightly infundibuliform, being terminated by a thin and distinct, almost entire margin, slightly bilobed; this orifice is closed by a large, sphe-

* A drawing of this plant with sectional details is shown in plate 58.

rical, and slightly bilobed green stigma, covered with numerous spiculate papillæ, with a hollow in the centre communicating with the channel of the style. In *Cestrum*, the style is terminated by two lamellar lobes, whose inner surfaces are covered with stigmatic glands, forming a somewhat bilobed capitate head. These differences in structure are small, and not to be discerned in the dried state, and therefore of themselves scarcely afford sufficient ground for a generic distinction; but combined with a very peculiar habit, easily distinguishable from that of *Cestrum*, they justify me in recalling the recommendation suggested, as above quoted, and in reinstating the genus, as proposed by Mr. Bentham, with the following amended character: not having seen the seed, I copy the description of it and the fruit wholly from that of Endlicher. 'Gen. Pl.' 3867. In coming to the above conclusion, it ought to be stated at the same time, that *H. tomentosus*, with its small calyx and the paucity and smallness of its bracts, does not sensibly differ in habit from many species of *Cestrum*, while on the contrary *C. bracteatum* and *C. organense* possess the large involucrating bracts that characterize most species of *Habrothamnus*. As the description and figure given by Kunth, of *Cestrum roseum*, correspond entirely with *Habrothamnus*, I have added it, as another species of this genus, and others may perhaps also be found to belong here.

Habrothamnus, Benth., (char. emend.).—*Calyx* tubulosus, coloratus, 5-dentatus, dentibus acutis. *Corolla* infundibuliformis, tubo imo angusto, summo inflato, ore contracto, limbo brevi, 5-partito, lobis acutis, reflexis, æstivatione implicativa*. *Stamina* 5, inclusa, æqualia; *filamenta* subulata, infra medium tubi inserta, apice subinflexa; *antheræ* ovatæ, 2-lobæ, spiculato-rugosæ, imo dorsi sine connectivo affixæ, utrinque longitudinaliter dehiscentes. *Ovarium* ovatum, apice umbilicatum, breviter stipitatum, stipite glandulo annulari instructo et cyatho (corollæ reliquo) circumdato, 2-loculare, dissepimento medio placentifero; *ovulis* paucis, spermadermis ligulatis suspensis. *Stylus* simplex, apice sub-incrassatus, infundibularis, ore integro sub-2-lobo. *Stigma* sphæricum glandulosum, subemarginatum, spiculoso-papillosum, medio cavum. *Bacca* calyce persistente cincta, 2-locularis. *Semina* pauca, angulata, umbilico ventrali. *Embryo* in axi albuminis carnosi rectus; *cotyledonibus* foliaceis, *radicula* tereti infera.—Frutices Mexicani et Ecuadorenses *sub-tomentoso-pubescentes, pilis articulatis*; folia *alterna, integerrima*; flores *inæqualiter cymosi, aut sub-*

* Æstivatio implicativa, nempe lobis singulatim conduplicatis, hoc modo, marginibus sese æque cum contiguis induplicato-conniventibus, nec ut in *Cestro*, marginibus solummodo cum contiguis induplicato-valvatis.

fasciculati, bracteis magnis sæpius involucrati, calycibus corollis baccisque rubris.

The species described are the following:—

1. *Habrothamnus fasciculatus,* Bth., Pl. Hartw. n. 369; Trans. Hort. Soc. iii. 1. tab. 1; Bot. Mag. tab. 4183. *H. elegans,* Schweid. *H. purpureus,* Lindl. Bot. Reg. n. s. 15. tab. 43. *Meyenia fasciculata,* Schl. Linn. viii. 251.
2. *Habrothamnus Benthami,* Miers, Lond. Journ. Bot. v. 151. *H. tomentosus,* Bth. Pl. Hartw. n. 369.
3. *Habrothamnus Endlicheri,* Miers, Lond. Journ. Bot. v. 151. *H. corymbosus,* Endl. Bot. Mag. tab. 4201; Van Houtte, Flor. ii. tab. 10. *Meyenia corymbosa,* Schl. *loc. cit.* 252.
4. *Habrothamnus cyaneus,* Lindl. Bot. Reg. n. s. Misc. 72.
5. *Habrothamnus paniculatus,* Mart. & Gal., Bull. Acad. Brux. xii. 148.
6. *Habrothamnus roseus,* Mexico. *Cestrum roseum,* H. B. K. iii. 59. tab. 197.

Coleophora.

This is a new genus evidently belonging to *Thymeleaceæ*, which I established a few years ago, upon some very singular floriferous buds sent to me from Rio de Janeiro by my son, who found them growing upon the trunk of a large and lofty tree in the dense forest that covers the ascent of the Serra d'Estrella above Iguassù, that being a continuation of the celebrated Organ Mountain range, and not far from Mandioca, a place well known to all botanical travellers as the residence of Baron Langsdorff. Owing to the extreme height of the trunk, its branches were far beyond reach, so that it was impossible to procure a single leaf-bearing specimen. We can hardly imagine that the buds here described form a distinct plant, parasitic upon the lofty tree alluded to, as we have no instance of any such parasitism in that family; on the contrary, it consists mostly of large trees, and we may conclude from analogy, that these are floriferous buds, emanating from the parent trunk: this is the more probable, from the structure of the involucrating bracts that constitute the buds, which are imbricate upon one another, broad, concave, 4-lobed, destitute of any midrib or nervure, and marked by numerous parallel or radiating veins, somewhat like those seen in the fronds of *Adiantum*; from this, they would seem to partake more of the nature of involucrating bracts than of leaves. The chief peculiarities in its floral structure are the long filiform support of the ovarium, which is inclosed in a tubular petaloid hypogynous nectarium, whence its generic name, from κολεὸς, *vagina*, and φορέω, *fero*. The only instance I can find of any

similar vaginiform tube in this family is in the genus *Erioselena* of Blume.

COLEOPHORA, gen. nov.—*Flores* hermaphroditi. *Perigonium* coloratum, infundibuliforme, tubulosum, imo usque ad medium coarctatum, illic intus hirsutum, fauce extusque omnino glabrum, limbo 4- rarius 5-fido, laciniis acutis, reflexis, margine ciliato-fimbriatis, apice inflexis, per æstivationem alternatim imbricatis. *Stamina* 8–10, exserta, biseriata, 4–5 ad faucem corollæ laciniis opposita, 4–5 paullo inferiora in sinubus cum laciniis alterna; *filamenta* brevia, subincurva, inflexa; *antheræ* ovato-rotundatæ, introrsæ, subversatiles, 2-loculares, loculis connectivo crasso dorsali affixis et longitudinaliter dehiscentibus. *Pollen* globosum, reticulatum. *Nectarium* infundibuliforme, coloratum, glabrum, ovarium stipitatum cingens, perigonio dimidio brevius, imo e toro glanduloso parvo basi perigonii adnato ortum, ore 4-fissum, laciniis inæqualibus, linearibus, erectis: *stipes* filiformis, glaber. *Ovarium* oblongum, gibbosum, utrinque attenuatum, pilosum, 1-loculare, 1-ovulatum, *ovulo* anatropo ex apice appenso. *Stylus* erectus, filiformis, ovario æquilongus, glaber. *Stigma* capitatum, inclusum. *Fructus* ignotus.—Arbor *Brasiliensis, procera*; foliis *ignotis, trunco gemmulifero*: gemmæ *aggregatæ, globosæ, e* bracteis *complurimis imbricatim convolutis*: racemus *glaber, sesquiuncialis, pluriflorus.*

1. *Coleophora gemmiflora*;—gemmis involucratis, pisi magnitudine, conglobatis, e cortice ortis, bracteis concavis, suborbiculatis, 4-lobatis, lobis rotundatis, crenato-incisis, 2 inferioribus minoribus, pilosis, fusco-rubris, margine ciliis albidis longis fimbriatis, rachi venisque destitutis, venis creberrimis, e basi subparallelis; racemo sesquiunciali, erecto, glabro, pluriflori; pedicellis alternis, nudis, cum flore articulatis; perigonio aurantiaco; vagina flava.—In sylvis primævis procul Iguassù, Prov. Rio de Janeiro*.

TESSARANDRA.

With the exception of a single instance, recorded by Aublet, all the plants belonging to the family of the *Oleaceæ*, including the *Fraxineæ*, possess unsymmetrical flowers, *i. e.* a small 4-partite calyx, a corolla cleft to the base into four divisions, and only two stamens: it will not therefore excite surprise, if we find a plant offering the normal number of stamens. This indeed occurs in the case of a very pretty shrub that I found near Rio

* A drawing of this plant, with full generic details, is given in plate 61.

de Janeiro, for which some years ago I proposed a new genus under the name of *Tessarandra*, from τέσσαρα, *quatuor*, ἀνὴρ, *stamen*. Aublet describes his *Mayepea* as having the calyx and corolla of a *Chionanthus*, with four stamens opposite to the petals, an arrangement quite contrary to their usual position, which is alternate with them. In Aublet's figure the stamens are shown to possess a distinct connective, both longer and broader than the anther-cells, a character at variance with the usual structure of the order. This also partly occurs in *Tessarandra*, where the filaments terminate in a fleshy connective exceeding the length of the anthers which are affixed to it on its external face, thus offering another anomaly in their extrorse aspect and dehiscence. It also differs from other Oleaceous genera in its ovarium being seated and partly immersed in a fleshy disc which is adnate upon the torus. In all other essential respects, more particularly in the structure of the ovarium and of the fruit, *Tessarandra* resembles *Chionanthus*, so that it belongs evidently to *Oleaceæ*, and to the tribe *Chionantheæ*.

The following is an outline of its generic features:—

TESSARANDRA (gen. nov.).—*Calyx* parvus, urceolatus, 4-fidus, dentibus obtusiusculis, persistens. *Petala* 4, hypogyna, æqualia, linearia, apice obtusa. *Stamina* 4, æqualia; *filamenta* brevissima, dilatata, extus carinata, petalis alterna et iis basi subconcreta; *antheræ* extrorsæ, 2-loculares, loculis oblongis, appositis, parallelis, ad connectivum crassiusculum angustiorem filamento continuum et ultra eos productum dorso affixis, extus longitudinaliter dehiscentibus. *Ovarium* oblongum, subconicum, toro carnoso imo subimmersum, 2-loculare, 4-ovulatum, ovulis geminis, collateralibus, infra apicem dissepimenti utrinque suspensis. *Stylus* brevis. *Stigma* 2-lobum, lobis crassis, divaricatis. *Drupa* baccata, abortu 1-locularis, 1–2-sperma, *putamine* chartaceo, venoso-striato, *endopleura* tenui, *chalaza* basali incrassata. *Semina* solitaria, rarius gemina, loculo conformia, exalbuminosa, *cotyledonibus* magnis, carnosis, plano-convexis, *radicula* minima, discoidea, iis immersa, supera. —Arbuscula *Brasiliensis, glaberrima*: folia *opposita, adpressa, sessilia, integerrima, ovata*; paniculæ *axillares et fere terminales, laxe brachiatæ*, pedicellis *imo bracteatis*.

1. *Tessarandra Fluminensis*;—foliis sessilibus, ovatis, subcordatis, apice obtusis et emarginatis, decussatis, erecto-adpressis, coriaceis, venis prominentibus, subtus glaucis, ad axillas venarum barbatis, rachi prominente basi nodoso-incrassato; calyce extus pubescente, dentibus ciliatis, intus nervo prominente pilosulo; petalis luteo-viridescentibus; bacca majuscula, violacea.—Rio de Janeiro, *v. v.*

This is a small tree with dense opake foliage, which I found growing upon the Morro Flamengo, a hill at the point of Botafogo Bay, near Rio de Janeiro. Its opposite leaves are erect, almost adpressed to the stems, sessile, ovate, somewhat cordate at base, rounded, with a small emarginature at the summit; they are 2 to $2\frac{1}{2}$ inches long, and $1\frac{1}{2}$ to 2 inches broad, with internodes distant $\frac{1}{2}$ to $\frac{3}{4}$ of an inch; they are thick and coriaceous, the upper surface dark green, rather polished, with raised venations, and a minute pubescence scarcely visible by the naked eye; beneath they are of a pale glaucous green, the midrib being thick and prominent, and tumid at base; a tuft of hairs adjoins the midrib at the base of each nerve. The inflorescence is generally terminal in the branchlets, in the axils of the young leaves, in slender panicles about 2 inches long, with oppositely divaricating bracteated branchlets; the pedicels being very short and square, with a small oblong, concave, reflected bract at base, with ciliated margins. The persistent calyx, scarcely a line in length, has a short cup-shaped tube, rising from a small fleshy torus, with its border divided into four unequal, rather obtuse, erect segments, the two lateral ones being somewhat broader; these have on the inner face a very prominent midrib, which, as well as the margin, is beset with white ciliate hairs. The corolla consists of four alternate equal, linear, white, revolute petals, with a rounded apex and an inflected margin, about half an inch long and 1 line broad. The stamens are very small, barely a line in length; the filaments being very short, broad, fleshy, expanding at the base, and though free, form a sort of hypogynous tube around the ovarium and within the base of the petals, with which they alternate; they terminate in a fleshy connective that exceeds the anthers, forming an obtuse appendage at their summit; the anthers are coriaceous, oblong, with two distinct parallel cells fixed at the back of the connective, the dehiscence being thus extrorse, by a longitudinal fissure in each cell; the pollen is minute, yellow, granular, and marked with rounded prominences at triangular distances. The ovarium is oblong, 2-grooved, 2-celled, the cells being lateral and opposite the broader segments of the calyx, each containing two ovules, suspended collaterally on the dissepiment a little below its summit. The style is very short and thick, terminated by a stigma, with two fleshy, obtuse, divaricate lobes. The berry is dark purple, oval, about $\frac{3}{4}$ of an inch long and $\frac{5}{8}$ of an inch in diameter, with little pulp, inclosing a single coriaceous putamen, marked outside by several reticulated venous threads, branching from the base; it contains two seeds, which are often unequal in size, without any intervening dissepiment, or sometimes only one by abortion; the testa is thin, brown, with a slender adhering integument, and marked with a

small chalaza at the end opposed to the radicle ; the cotyledons are large and fleshy, filling the entire cavity of the testa, flat within and convex without ; the radicle is superior, very short and small, and appears like an umbilicate disk. The plant in Gardner's Brazilian collection, no. 760, is identical with the above*.

Schwenkia.

This is a genus of considerable interest, on account of the singular structure of its corolla, which for a long while offered a question difficult of solution. It was considered by Jussieu as nearly allied to *Browallia*, the two genera being placed by him among the *Labiatæ*. Linnæus, with much penetration, suggested its affinity to the *Solanaceæ*, an opinion quite disregarded by succeeding botanists. By Kunth it was classed, together with *Browallia*, in the *Scrophulariaceæ*. Dr. Lindley, in his 'Introd. to Bot.' p. 224, arranged it among the *Primulaceæ*, because the stamens are opposite to the expanded segments of the border of the corolla. Mr. Bentham subsequently pointed out what he considered to be the true nature of those gland-like processes, always seen between the divisions of the border, and which he showed to be the true segments, while the others were mere appendiciform expansions, and under this ingenious point of view, he was enabled to reconcile its structure with the opinions of Jussieu : following the example of Kunth, he therefore arranged both *Schwenkia* and *Browallia* in the *Scrophulariaceæ*, among his tribe of the *Salpiglossideæ* (De Cand. Prodr. x. p. 122). Martius suggested its affinity with the *Acanthaceæ*, a view not confirmed by other botanists, and quite unsupported by facts. It is now four years since I first explained in what respects this genus differs from *Browallia* and other genera of the *Salpiglossideæ* (*huj. op.* vol. i. 177), and I indicated the circumstances that, in my opinion, point to its nearer affinity to *Fabiana*, in the *Solanaceæ*. This genus forms one of those instances, in which it is difficult to determine, under the ordinary interpretation of the respective ordinal characters, whether it belongs to *Solanaceæ* or *Scrophulariaceæ*. In order to obviate uncertainty in similar cases, I endeavoured to show (*loc. cit.* p. 163), and again lately (*huj. vol.* p. 46), how by separating certain anomalous genera of these two orders, marked by peculiar characters, into a separate family, a prominent and unerring line of demarcation may be established between the former,—a difficulty that has hitherto puzzled every botanist. Under this test, *Schwenkia* must be referred to the *Solanaceæ*, on account of the decidedly valvate æstivation of the corolla, as I shall presently endeavour to show.

* A figure of this species, with generic details, is shown in plate 62.

It may be urged, that in *Schwenkia* the total number of lobes in the border being generally more than five, and the suppression or diminution of some of these and of the stamens being of frequent occurrence, are features quite foreign to the *Solanaceæ*. But in *Hebecladus* and *Dunalia* we meet with five intermediate teeth between the lobes of the border, and in *Nectouxia*, an annular 10-toothed ring is placed in the mouth of the corolla, within the line of origin of the five segments, forming thus a corona, closely analogous in its nature to those more expanded petaloid segments which Mr. Bentham describes as appendiciform processes in *Schwenkia*. In this genus the stamens are always five in number, and are situated below the middle or near the base of the tube of the corolla; of these, two, or sometimes four, are antheriferous and reach the mouth of the tube, while three, two, or one, are occasionally sterile or anantherous, the filaments in such case being sometimes short and rudimentary. In many Solanaceous plants there is often a difference in the size of the stamens, and this becomes a constant feature of the section *Nycterium* of the genus *Solanum*, where three of them are always considerably larger than the two others, which are sometimes almost sterile. The suppression of some of the anthers, and of a portion of the glandular-looking lobes (true segments) of its border in *Schwenkia*, must be considered one of those exceptional cases which are occasionally met with in a great many orders; it serves as a point of osculation between the *Solanaceæ* and *Scrophulariaceæ*, in which latter family, the want of symmetry in its parts, and a total or partial suppression of one of its stamens, form almost universal characters. On the other hand, we meet in the same family several cases where the corolla is pentamerous, and as regularly symmetrical in its parts as in *Solanaceæ*; thus in *Capraria* (*Xuaresia*, R. & P.), we find a corolla with a border of five equal lobes and five equal stamens; so also in some species of *Verbascum*, and in *Sibthorpia*, where likewise the stamens are generally five, and equal in number to the regular segments of the border, although rarely four or eight occur. In my definition of *Schwenkia*, as given below, I have modified somewhat Mr. Bentham's view of the structure of the corolla, considering the expanded segments of the border to be analogous in their nature to the corona of *Nectouxia*.

Referring to the question of æstivation, it will be seen that in the sections *Chætochilus*, *Euschwenkia*, and *Brachyhelus*, where the segments of the corona are small, they are valvately conjoined in bud by their floccose margins into a short cone, that closes the mouth of the tube, the lobes lying over them, and pointed toward the axis: in *Brachyhelus*, these lobes, which are several times longer than the toothed segments, soon become approximated

in the axis, where they are connately disposed in an erect central column, so that both lobes and segments may be said to have a valvate æstivation: in *Cestranthus* the lobes are reduced to short teeth, but the segments of the corona are of considerable length, linear and acute, and also valvately disposed in bud, into a lengthened pentangular cone, exhibiting at its basal angles the five short lobes, as so many salient erect points. In *Cardiomeria* the lobes are equally short and similarly situated, but the very broad emarginated segments have their margins valvately disposed, and they are replicated lengthways down the middle, as in *Datura*, so that the corolla appears in bud like a slender tube swollen into a pentapterous form above, and terminated by five semilunate wings, depressed at the point of their union in the axis, and furnished on the external angles with the five salient short erect lobes, like so many uncinate teeth.

Besides the considerations above described, we have the evidence in the structure of the seed, that this genus must be referred to *Solanaceæ*, and not to *Scrophulariaceæ*, because the embryo, which is slightly curved, has its radicle pointed to the basal angle of the seed, and turned away from the ventral hilum, as shown by Gaërtner (De Fruct. tab. 214), while in the latter family the radicle always points to the true point of origin of the hilum. *Schwenkia*, like *Vestia*, has a stipitate ovarium, the support being enclosed in its hypogynous disk, and the corolla also falls away by a circumscissile line above its base, forming a small cup that invests the base of the ovarium: the mode of its placentation likewise resembles that of *Fabiana*, the points of attachment of the ovules being placed in several prominent longitudinal lines; the seed in a similar manner is slightly curved and hollow on its ventral face, the hilum being seen in this hollow.

Schwenkia, Linn.—D.C. Prodr. x. 192.—Chætochilus, *Vahl. Enum.* i. 102.—Mathea, *Vell. Fl. Flum.* i. tab. 51—(Charact. emend.).—*Calyx* tubulosus, 5-dentatus, vel semi-5-fidus, laciniis sublinearibus, præfloratione valvatis, persistens. *Corolla* monopetala, tubo elongato cylindrico, rarius supra medium infundibuliformi, sæpissime gibbosim subinflato, ore contracto, et hinc in lobos 5 glanduliformes producto, lobis erectis, lineari-teretibus setiformibus subæqualibus, aut inæqualibus et clavatis, vel ad dentes minutos mucroniformes redactis, fauce corona limbiformi rotata 5-partita instructo, segmentis seu brevibus et dentiformibus, vel oblongis, integris, acutis, expansis, lobis multo longioribus, aut truncato-oblongis, emarginatis, bifidisve, et tunc sæpe sese longitudinaliter retroplicatis, lobis segmentisque æstivatione valvatis. *Stamina* 5

inclusa, imo vel medio tubi orta, lobis alterna, et segmentis coronæ opposita, nunc 2 superiora fertilia et faucem attingentia, quinto summo duobusque anticis brevibus, vel his tantum (summo deficiente) anantheris sterilibusve, nunc 4 fertilia, summo quinto ananthero : *antheræ* conniventes, ovatæ, cordatæ, 2-lobæ, lobis ad connectivum tenuem dorso adnatis, rima longitudinali antice dehiscentibus. *Ovarium* oblongum, disco hypogyno cupuliformi suffultum, rarius disco obsoleto stipitatum, et hinc casu corollæ circumscissæ cyatho membranaceo imo cinctum, 2-loculare, placentis crassis, carnosis, dissepimento utrinque adnatis; *ovula* plurima, in lineas longitudinaliter digesta : *stylus* filiformis, inclusus ; *stigma* claviforme, pulvinatum, obsolete 2-lobum, apice umbilicatum. *Capsula* septicide 2-valvis, valvulis integris, dissepimento demum libero medio seminifero parallelis. *Semina* plurima, tetragono-oblonga, paullo curvata, *testa* scrobiculata : *embryo* intra albumen carnosum subincurvus, cotyledonibus oblongis, compressis, radicula infera tereti hilo umbilicato ventrali distante, vix latioribus et subæqualibus.—Herbæ suffruticesve *Americani* (*una specie etiam in Africa tropicali crescente*) : folia *ovata, aut lanceolata, integra,* floralia *decrescentia vel minuta ;* pedunculi 1-*flori, aut simpliciter pauciflori, breves, in paniculam foliosam vel subnudam dispositi.*

I have nothing to add to the excellent description and arrangement of the species, as determined by Mr. Bentham*, in D.C. Prodr. x. 193.

Lycium.

This genus is truly cosmopolitan, being found abundantly in Europe, Asia, Africa, and America, in the former more rarely in regard to the number of species, in the latter most abundantly. The species are mostly low straggling shrubs, or bushes of crooked and stunted growth, generally with thorny branches, often barren and knotty, the younger branches bearing usually fasciculated leaves: these branchlets commonly dwindle into short acute spines, which are both leafy and floriferous. They grow ordinarily in maritime situations, or in inland sandy deserts, where the soil is more or less impregnated with saline matter. Contrary to general rule, the leaves and the habit of the plants afford uncertain specific characters; for the leaves are often so polymorphous, that specimens of the same plant are sometimes mistaken for different species, and on the other hand, many species so closely resemble each other, in habit and form of their

* Analytical details of the æstivation and structure of the five different sections of this genus are given in plate 63 of this volume.

leaves, that they are frequently confounded together*. For these reasons I have been led to search for more certain specific characters in the structure of the flowers, which appear to afford constant features that may be relied upon, and this has induced me to remodel the genus, and revise all the species within my reach. As *Lycium* has recently been so fully elaborated by M. Dunal, and the numerous species described by him have been accompanied with such copious and minute details, this may appear to be quite unnecessary; but my inquiries have convinced me, that for the purposes of specific distinction, little value is to be placed upon many of these ample definitions, and that it is requisite to examine the same materials again with more caution. M. Dunal enumerates only three South American species; I have here described thirty: during my travels thirty years ago, I met, on the confines of the Andes, with many plants hitherto unnoticed; and I find in Sir W. Hooker's rich herbarium, other new species, besides several from the northern portion of that hemisphere, as well as many of Asiatic and African origin, which I now propose to describe.

Of the 70 species I have enumerated (besides those that are dubious), 33 belong to the old, and 37 to the new world. Of these, 3 are found in Europe, 2 in Madeira and Barbary, 3 in Tartary, 6 in Arabia, Persia, Guzzerat and Scinde, and 19 in South Africa; and in the other hemisphere, 1 in the United States, 6 in California and Mexico, 1 in the West Indies, 2 in Peru, 6 in Chile, 3 in Southern Patagonia, 13 in the extensive shingle plains that skirt the eastern flanks of the Cordillera, or that penetrate its gorges, 3 in the vast mud deposit that forms

* This was long ago (1813) shown by Poiret, who says, Dict. Méthod. Suppl. iii. 427:—"La plupart des espèces qui composent les *Lycium* sont tellement rapprochées, qu'elles sont difficiles à bien caractériser, d'autant plus que la plupart cultivées, varient dans la forme et la grandeur de leur feuilles, dans le nombre des divisions du calice et de la corolle, d'où il est résulté de la confusion dans la synonymie, et beaucoup de doutes pour quelques espèces, établies par des auteurs modernes." Indeed the habit of *Lycium* is peculiar, where we observe a constant tendency to the abortion of its branchlets, especially when grown in arid and saline places; we then commonly find in each axil of the stems, a protuberant knotty excrescence, sometimes quite bare, which is, in fact, a leaf-bud or gemma, checked in its earliest development and lignified; generally, a few elementary leaf-scales succeed in escaping from the gemma, forming a fascicle of starved leaves, and often the node is at the same time expanded into a longer or shorter spine, which again bears several similar suppressed nodes. In the same plant, however, when exposed to circumstances that favour a more rapid growth, we observe the nodes expanded into regular lengthened branches and branchlets, with much larger alternate leaves, in each axil. Hence it is, that the appearance of each species may become, and usually is so varied, that we are liable to constant error in determining its individuality from its habit alone, and the form or size of its leaves or spines.

the Pampas, and 2 in tropical Brazil. From this distribution it will be seen, that nearly one-fourth of the known species are found in South Africa, and another fourth on the two sides of the Andes within the latitudes of Chile; the latter district, however, has been very little explored, and there is every reason to believe it will be found by far the most prolific in number of species of any quarter of the globe.

According to M. Dunal's distribution of the genus, I find it absolutely impossible to determine the sections to which this large number of new species should be referred. He divides *Lycium* into four sections, *Schistocalyx*, *Eulycium*, *Amblymeris*, and *Lyciobatos*: *Schistocalyx*, distinguished by its calyx cleft to the base, comprises only two species, which I have shown do not belong to *Lycium**; *Amblymeris*, another new section, is pre-

* *Huj. vol. App.* p. 61. The first plant (my *Salpichroma ciliatum*, described in vol. i. p. 9 and 133; *Lycium ciliatum*, Schl.) is distinguished by its alternate pointed leaves, nearly as broad as long, almost cordate at base upon a short petiole, with ciliated margins, and covered with short jointed hairs, solitary axillary flowers with the peduncle afterwards reflected, its calyx split to the base into distinct linear segments covered with glandular hairs, especially on its margins, its corolla externally pubescent, with a short tube, and a border of 5 triangular reflected segments, the mouth of the tube closed by a densely villous ring of hairs around the place of insertion of the exserted stamens, the berry encircled by the longer enlarged calyx: such characters are foreign to *Lycium*, but closely correspond with *Salpichroma*, especially with its section *Perizoma*; this is strongly indicated by the triangular segments of the corolla, showing a valvate æstivation, while those of *Lycium* are always very rounded, and remarkably imbricated; this again is farther confirmed by the total absence of any induvial remains of the corolla after its fall, which is a constant feature in *Lycium*. The characters of this plant appeared to M. Dunal so different from others of that genus, as to draw from him the expression "an genus diversum?" I think there can be little doubt of its being allied to *S. rhomboidea* (*huj. op.* vol. i. p. 7. pl. 1).

In regard to the second plant, *L. serpyllifolium*, Dun., I observe, from M. Dunal's description, that its leaves are not fasciculated, its flowers are solitary and furnished beneath the calyx with narrow linear bracts, its calyx is split to the base into linear segments, its filaments are recurved at the apex, and its anthers subhemispherical and ciliated, with divaricated lobes; these are all characters quite foreign to *Lycium*, and more appertaining to *Scrophulariaceæ*.

Since the above was written, I have seen the original specimen in Dr. Burchell's collection, and find my previous inferences fully verified. As the plant is yet otherwise undescribed, I will here annex its characters: it is difficult to imagine upon what grounds it could have been referred to *Lycium*.

Peliostomum serpyllifolium. *Lycium serpyllifolium*, Dun. in DC. Prodr. xiii. 509;—suffruticosum, ramis e basi erectiusculis, subvirgatis, rugosis, striatis, albescentibus, ramulis brevibus, glabris, apice rigide et obsolete pubescentibus, foliosis; foliis alternis, viridibus, ovatis obovatisve, subobtusis, in petiolum brevem attenuatis, crassis, enerviis, glaberrimis; pedunculo axillari, brevi, uniflori, bracteolis 2 setiformibus, oppositis, infra

ceded by a long string of characters, a mere repetition of the generic diagnosis, without a single differential feature to discriminate it from other sections; while *Eulycium* and *Lyciobatos* are simply adopted from Endlicher (the latter being the *Isodontia* of Don); these last are founded on the inequality or equality of the teeth of the calyx, and the greater or less inclusion of the stamens; the latter circumstance, of course, depends on the relative depth of the incisures of the corolla: the former character is so uncertain in its value, that in the same specimen the calyx is sometimes found regularly 5-toothed, while at other times it assumes a somewhat bilabiate form, caused during its partial growth by the splitting of two or three of its teeth: in regard to the relative depth of the segments of the border of the corolla, and the consequent amount of inclusion or exclusion of the stamens, I find the extremes of these opposite features mixed together in all the different sections, so that notwithstanding it has been proposed as the rule of distinction, this character has been wholly disregarded in the distribution of the species, as will be seen in the sequel. The best proof that can be shown of the small utility and value of these characters is evidenced by the fact, that while other botanists include in the *Isodontia* of Don (*Lyciobatos*, Endl.), *Lycium Afrum*, *tenue*, *propinquum*, *rigidum*, *cinereum*, *horridum* and *tetrandrum*, and exclude them from *Eulycium*, M. Dunal separates *L. Afrum*, *rigidum*, and two others, to constitute his section *Amblymeris*, leaving all the other species above mentioned in *Eulycium*; his *Lyciobatos* being confined to the old Linnæan species *L. Europæum* and three others, that have no relationship with it whatever, the former species being placed by other botanists in *Eulycium*. Kunth and Schlechtendal, again, station *L. Europæum*, *barbatum*, and *Chinense* in

calycem gerente, calycis persistentis sepalis 5 linearibus, rigidè puberulis, corolla calyce 3-plo longiore, tubo supra basin contracto, demum obconico, hinc late ampliato, nervis plurimis lineato, rigide glanduloso-pubescente, limbi laciniis 5, rotundis, reticulato-venosis et maculato-pictis; capsula oblonga acuta calyce paullo longiore.—C. B. S. ad Buffel-bout, Lat. 30° 20′ legit cl. Burchell.—v. s. in herb. Burchell, no. 1596.—*Frutex* subpedalis, *radice* fusiformi, lignoso, 5-pollicari; *folia* 3–5 lin. longa, ¾–1 lin. lata, *pedunculus* 1 lin. longus, *bracteoli* ½ lin. longi, *sepala* linearia, acuta, rigida, erecta, 2 lin. longa; *corolla* 5 lin. longa, 2½ lin. lata, contractione basali calyce breviori, limbi laciniæ subæquales; *stamina* didynama, inclusa, *filamenta* membranacea, compressa, e contractione tubi orta, apice spiraliter voluta, *antheræ* subtriangulares, æquales, pilis longis hispidæ, loculis confluentibus, rima verticali dehiscentes, marginibus valvarum rigide ciliatis: *ovarium* conico-oblongum, calyce tertio brevius, glabrum; *stylus* usque ad medium hirsutulus, superne inflexus, subexsertus, *stigma* minimum, emarginato-bilobum: *capsula* 2-valvis, 2½ lin. longa, 1¼ lin. lata, apice subcompressa, acuta, valvis dissepimento parallelis, semibifidis, sepalis persistentibus amplexa.

Eulycium, and *L. Afrum* in the section corresponding to *Lyciobatos*. This shows what different constructions various authors give to the same characters, and how useless they are for purposes of discrimination.

In order to prevent a multiplication of these errors, it appears desirable to abolish these sections altogether, and to distribute the species of *Lycium* in three new divisions, founded simply on the relative depth of the incisures of the corolla; viz.—1. *Brachycope*, where the lobes of the border are one-third (or less) of the entire length of the corolla; 2. *Mesocope*, where the segments are yet longer, but do not exceed the length of the tube; and 3. *Macrocope*, where the divisions of the corolla exceed in length that of the tube: in this latter case the stamens are affixed in the throat of the tube, and are far exserted, when the border becomes expanded.

I have repeatedly endeavoured to show that *Lycium* should not be classed among the *Solanaceæ*, because of the very imbricate æstivation of the segments of the corolla. Prof. Schlechtendal more than twenty years ago (Linn. vii. 72) clearly indicated his doubts to this effect. M. Dunal however, in the 'Prodromus,' still follows the example of preceding botanists in arranging *Lycium* in that family, and constitutes it the type of one of his great divisions of the *Solanineæ* (*Lycineæ*), which there comprises a number of genera that have little relation with it, or with each other, as I have shown (*huj. vol. App.* p. 49). Evidence had previously been offered by me demonstrating its position in the family of the *Atropaceæ* and in the tribe *Atropeæ*, as it possesses those essential characters by which that tribe is peculiarized (*huj. op.* i. *App. p.* 166). Although in its general features it offers some approach to *Atropa*, it comes nearest to *Mandragora* in its floral structure, but not in its habit, agreeing with it in the form of its calyx, its tubular corolla with a border of five equal segments having an imbricated æstivation, one being always exterior; in its stamens inserted in the tube, the filaments often very unequal in length, being generally furnished with tufts of hair a little above the geniculated points of their insertion; in the style being declined away from the external lobe of the border; in the form of its stigma, its bilocular ovarium with large fleshy placentæ adnate to the dissepiment, in its baccate fruit supported by its persistent unchanged calyx, and its spiral terete embryo.

The calyx in *Lycium* is generally small and cupshaped, with five erect teeth; these are mostly equal, but sometimes one, two, or three of the teeth become imperfectly confluent with the others, appearing thus irregularly 3-toothed or bilabiate, a feature originating, as before observed, in the partial splitting of

the teeth, a character that often varies in amount with its age, and in the same specimen: it is always persistent, and little changed with the growth of the fruit. The corolla is always contracted below the point of insertion of the stamens, is cylindrical towards the base, the tube being often inflated or more or less funnel-shaped above, with a border sometimes narrow, having five small rounded imbricated lobes, or frequently these divisions are longer, being often continued through the whole infundibuliform portion of the tube to the insertion of the filaments, in which case they become wholly exserted after the expansion of the border: these features are so constant in different individuals as to afford excellent sectional characters. The corolla, although very often symmetrical in its form, is not constantly so, for in many species the tube is more or less inflated upon the side opposite to that of the more exterior lobe of the border, and both stamens and style are somewhat declined towards this gibbous portion: one, two or three of the stamens are often considerably shorter than the others, which do not exceed the total length of the corolla; they are sometimes even still shorter, and wholly included within the tube after the expansion of the border. The filaments are generally geniculated, or suddenly bent at the point of their insertion into the tube of the corolla, and again curve a little above this point into an erect position, and here they are often furnished with a dense globular tuft of white hairs, which form a fornix closing the mouth of the contracted portion of the tube around the base of the style; in several cases the filaments at their base are distinguished by a flat adnate fleshy process, fringed on its margin, bearing some analogy to the tooth of the filaments in *Cestrum*, or the gland-like scale in *Zygophyllaceæ*; they are sometimes altogether smooth. The ovarium is seated upon a short columnar support, to which the base of the corolla is persistently adnate: after impregnation, the corolla breaks away by an irregular circumscissile line, leaving a free persistent cup, which encircles the lower moiety of the ovarium: in the details given of many species of *Lycium* by M. Dunal, he describes this as a dentate cupular proper disk, but that is certainly a mistake; this circumscission of the corolla is a constant feature, and may always be relied upon as a good generic character, but this fact has hitherto escaped attention. The base of the ovary, enclosed within this induvial cup, is at the same time marked by a glandular enlargement of a different colour, which is a true adnate hypogynous disk, although sometimes this is almost obsolete. The ovarium is uniformly 2-locular, with numerous ovules in each cell attached to a thickened placenta adnate to the dissepiment. The berries supported on the small persistent calyx are scarlet, black, or

blue: they contain several flattened reniform seeds, surrounded by pulp, and attached to the central placenta: their slender terete embryo, enclosed in solid albumen, is spirally helical, that is to say, it consists of more than a single volution, which is not coiled in a plane, but rises in the middle in a slightly conical form like the whorl of a snail-shell; the radicle, equal in length and diameter to the cotyledons, points to the basal angle of the seed at some distance from the lateral hilum, which is situated in a conspicuous sinus on the ventral margin. The following is offered as a more exact expression of its generic features than that given in the 'Prodromus' referred to.

Lycium, Linn.; DC. Prodr. xiii. 508 (char. emend.).—*Calyx* tubuloso-campanulatus, 5-dentatus, vel sub-5-fidus, dentibus sæpe irregularibus vel aliquantulum confluentibus, persistens. *Corolla* tubulosa vel infundibuliformis, tubo imo constricto et hinc demum circumscisso, limbo 5- rarius 4-fido, laciniis rotundatis vel oblongis, obtusis, tubo brevioribus aut longioribus, reflexis, æstivatione valde imbricatis, lateribus sese ample tegentibus. *Stamina* 5, rarius 4, laciniis alterna, sæpe inæqualia, medio vel supra basin tubi inserta, longitudine corollæ aut breviora; *filamenta* filiformia, glabra, vel supra insertionem semper geniculatam interdum barbata, sæpe longius hirsuta, aut ad basin glandula lineari antice sita, margine ciliata donata; *antheræ* oblongæ, 2-loculares, loculis adnatis, æqualiter 2-valvatis, rima longitudinali margine dehiscentibus. *Pollen* globosum longitudinaliter 3-sulcatum. *Ovarium* breviter stipitatum, oblongum, imo disco carnoso adnato sæpissime fere obsoleto et cupula libera (corollæ reliquo) circumdatum, 2-loculare, placentis dissepimento coadunatis, multiovulatis. *Stylus* simplex, staminibus subæquilongus, apice paullo incrassatus. *Stigma* depresso-capitatum, plus minusve 2-lobum. *Bacca* calyce sæpe irregulariter fisso suffulta, globosa, aut ovata, 2-locularis. *Semina* plurima, compressa, reniformia; *testa* scrobiculata, crustacea; *embryo* intra *albumen* carnosum, helico-spiralis, teres, *radicula* angulo basali spectante, hiloque marginali evitante, cotyledonibus semiteretibus æquilonga.—Arbusculæ vel frutices *sæpius spinosi, præsertim in America et Africa, pauci in Europa australi et Asia crescentes*; folia *alterna, integra, sæpissime e gemmis foliaceis axillaribus fasciculata*; flores *pedunculati, solitarii, gemini, vel aggregati, axillares, vel sæpius e gemmulis foliaceis in spinis sistentes, aut rarius ex axillis approximatis pseudo-terminales*; corollæ *albidæ, flavescentes, roseæ, vel coccineæ.*

1. Brachycope. *Corolla fere cylindrica, interdum paullo ventri-*

cosa, limbi laciniis parvulis, tubi dimidio longitudine, vel adhuc sæpius brevioribus.

A. Gerontogeæ.

* *Filamenta lævia.* Sp. 1 ad 8.

1. *Lycium sævum* (n. sp.) ;—fruticosum, valide spinosum, spinis patulis, fuscis, nudis, folio brevioribus, aut foliiferis et tunc longioribus ; foliis crebre fasciculatis, spathulato-oblongis, apice rotundatis, a medio in petiolum angustatis, pallidis, crassiusculis, eveniis, utrinque obsolete puberulis ; floribus e fasciculis solitariis aut binis, pedunculatis, calyce brevi, tubuloso, submembranaceo, subæqualiter 5-dentato, dentibus pubescentibus, corolla subcylindrica, tubo superne paullo ampliato, utrinque glaberrimo, limbi laciniis 5, rotundato-ovatis, margine subciliatis, staminibus 5 inclusis, 2 faucem attingentibus, reliquis multo brevioribus, filamentis omnino glabris, paullo infra medium tubi insertis ; stylo filiformi, tubo æquilongo.—Arabia.—(*v. s. in herb. Hook.* "*ad Cisternas* Geddæ," *Fischer, no.* 98.)

This plant appears to be identical with that described by M. Dunal in DC. Prodr. xiii. 524. as "*L. Mediterraneum, sectio longiflorum, an species diversa* ? *var.* δ. *cinereum,*" and found in the same place by Schimper. Its leaves are 6 to 9 lines long, $1\frac{1}{2}$ or 2, rarely 3 lines broad ; the peduncle is $1\frac{1}{2}$ line, and the calyx barely 1 line long ; the tube of the corolla 5 lines in length, $1\frac{1}{2}$ line diameter ; segments $1\frac{1}{4}$ line long, 1 line broad, the margins being slightly ciliated, while all the rest of the corolla is smooth : the stamens are perfectly glabrous, as well as the tube beneath their insertion, one of the stamens being only two-thirds the length of the two that reach the mouth of the tube*.

2. *Lycium Europæum*, Linn. Syst. i. 228 ; Mant. 97 ; Sibthorp, Fl. Græc. i. 155. tab. 236. L. salicifolium, *Mill. Dict.* no. 3. tab. 171. fig. 2. L. Mediterraneum (§ breviflorum), *Dun. in DC. Prodr.* xiii. 524, cum aliis variis synonymis et citationibus auctorum ;—ramulis erectis, subteretibus, glabris, vel albido-pruinosis, spinosis, junioribus angulatis, albescentibus, et glanduloso-pilosulis, spinis nudis, vel longioribus et gemmiferis, gemmis sæpe tuberculatis ; foliis fasciculatis, spathulato-oblongis, apice acutis vel obtusiusculis, imo in petiolum elongatulum cuneatis, subglabris vel sub lente parce glanduloso-pilosis ; floribus e fasciculis solitariis vel binis, pedunculo longiusculo, calyce subpoculiformi, membranacco, primum æqualiter 5-dentato, demum sub-bilabiato, dentibus

* A drawing with analytical details of this species is given in plate 64 A.

obtusiusculis sphacelato-puberulis; corolla tubuloso-infundibuliformi, glabra, tubo intus infra insertionem staminum piloso, limbi laciniis 5, rotundis, glabris, tubo 4to brevioribus, staminibus 5 inclusis, faucem attingentibus, 3 paullulo brevioribus, filamentis medio tubi insertis, et in nervis totidem decurrentibus, hinc tuboque pilosulis, parte libera omnino glabris; stylo capillaceo, vix exserto, cum ovario articulato: bacca pisiformi subglobosa.—Per totam Europam Australem, præsertim in Græcia abundat, unde pro sepibus antiquissime introductum, forsan in Africam Borealem spontaneum, Insulasque Madeira et Canarienses.—*v. s. in herb. Hook.* (Madeira) *Lemann*, no. 552 (*in sepibus* Portûs Sancti *abundans*)*.

M. Dunal rejects the Linnæan name, merely because the plant is not common throughout all Europe; but on the same ground, the name he has substituted is equally inappropriate, since it is acknowledged by himself, that although it occurs in Southern Europe and the Mediterranean Islands, it has originally been introduced there. If we must reject the Linnæan name, for which I can see no reason, it would be infinitely better to adapt a synonym nearly as old, in preference to a new and unsuitable term, in which case Miller's name, by common rule, would claim precedence over that of M. Dunal.

A considerable difference is observable in this and the preceding plant, both in habit and in the structure of its flowers. It is a species well known, and frequently found in gardens in England. The barren spines measure 3 to 5 lines, but the gemmiferous spines are much longer: the leaves are usually from 9 to 15 lines long, $1\frac{1}{2}$ to 3 lines broad, and attenuated into a slender petiole; the pedicel is 2 lines in length, the calyx is $\frac{3}{4}$ line long; the tube of the corolla is a little curved, 5 lines long, $1\frac{1}{2}$ line diameter in the middle, $2\frac{1}{2}$ lines in the mouth, the rounded glabrous segments being $1\frac{1}{2}$ line in diameter. A specimen in Sir Wm. Hooker's herbarium from one of the Canary Islands (Palma, *Bourgeau*, no. 924), affords a good example of what has been before said respecting the variation of habit and difference in the size and shape of the leaves sometimes found in the same individual. One branchlet bears some short, stout, bare, axillary spines, little more than 3 lines in length; but other axils that are without spines, produce a single large fleshy leaf from 2 to $2\frac{1}{2}$ inches long, and $\frac{1}{2}$ an inch broad, somewhat obtuse at the apex, and attenuated into a petiolar base; another straight branch, 18 inches long, is beset with numerous straight bare spines, 1 to $1\frac{1}{2}$ inch long, accompanied by separate alter-

* A drawing with details of this plant is shown in plate 64 B.

nate leaves, 3 to 6 lines in length, 1 to 3 lines broad, and without flowers; a third, and more fragmentary portion, has a single spine, $2\frac{3}{4}$ inches long, bearing three small bare spines, each 3 lines in length, and a single spineless nodose axil, producing five fasciculated leaves, about an inch long, and 3 lines broad, with four flowers, the peduncles of which are 4 lines in length: in all of these the corolla had fallen off, leaving the ovary encircled by its induvial cup and the persistent calyx.

3. *Lycium Indicum*, R. Wight, Icon. tab. 1403;—glaberrimum, ramis flexuosis, ramulis divaricatis, apice spinescentibus, vel abbreviatis, spinosis, spinis inferioribus nudis; foliis e gemmis fasciculatis, vel alternis, spathulato-oblongis, imo anguste cuneatis, sessilibus; floribus (in specimine) subsolitariis (in icon. cit. fasciculatis), calyce pedicello subæquilongo, tubuloso, 5-costato, dentibus cum costis continuis, sinubus rotundatis demum inæqualiter fissis: corolla (sicca) pallide flava, infundibuliformi, tubo calyce 4-plo longiore, glabro, limbi laciniis rotundis, ciliatis, tubo 4to brevioribus: staminibus glabris, valde inæqualibus, paullo supra basin tubi insertis, quorum 2 inclusis, 3 subexsertis; stylo exserto: bacca globosa, pisi magnitudine, apiculata, seminibus paucis.—Penins. Indiæ Orientalis.—*v. s. in herb. Hook.* Guzzerat et Scinde (*Stocks*, n. 112; *Dr. Thomson*, n. 57).

In this very distinct species the leaves vary considerably in form; Dr. Wight received his specimens from Dr. Stocks, and from the notes accompanying it, this distinguished botanist was led to infer that it might be only a variety of *L. Europæum*: in those notes Dr. Stocks talks of its bearded stamens, evidently confounding his own specimens with another species growing in Scinde. In Dr. Thomson's plant the leaves are fasciculated, obovate-lanceolate, 4 to 6 lines long, 1 to $1\frac{1}{4}$ line broad; the peduncle is 1 line long; the calyx, $1\frac{1}{2}$ line in length, is tubular, with long obtuse teeth; the corolla is contracted below, its tube being smooth and 4 lines long, its border having five rounded ciliated segments 1 line in diameter; the membranaceous filaments are quite smooth and included, two of them measuring 2 lines, the other three 3 lines; the style is 4 lines in length; the ovary, supported by a closely adnate gland, is surrounded at its base by the induvial cup of the corolla. The specimens from Guzzerat have leaves 12 lines in length and 4 lines in breadth; those from Scinde are obovate or oblong, 8 lines long, 3 to 4 lines broad: the pedicels, one or two in each axil, are 2 lines in length*.

* This species with analytical details is seen in plate 64 C.

4. *Lycium oxycarpum*, Dun. in DC. Prodr. xiii. 518. Lycium Afrum, *Drège*.—C. B. S.—*v. s. in herb. Hook.* (*Drège*).

The specimen above quoted is certainly distinct from *L. Afrum*; it is entirely smooth, with large knotted glands in the axils, out of which the spines grow; the leaves are 9 to 14 lines long, 2 to $2\frac{1}{2}$ lines broad; the pedicels are 5 lines long, the smooth cup-shaped calyx is $1\frac{1}{4}$ line long, the points of the angular teeth being tomentose; the corolla is tubular and smooth, the tube being $3\frac{1}{2}$ lines long, $1\frac{1}{2}$ line diameter, with small round segments $\frac{3}{4}$ line diameter: the stamens are included, the filaments being dilated at the base, and inserted near the bottom of the tube, and are almost its length, subequal, slender and smooth: the style is exserted*.

The variety *α. grandiflorum* of M. Dunal appears to be *Lycium austrinum*, nob.; var. *β. parviflorum* and *γ. angustifolium* may probably be small-leaved varieties of *L. oxycarpum*, but it is impossible to judge of this without examination.

5. *Lycium intricatum*, Boiss. Elench. Pl. Nov. Hisp. 143; Voy. Bot. Esp. n. 1215; Dunal in DC. Prodr. xiii. 525.—Hispania et Africa Boreali.—*v. s. in herb. Hook.* Oran. *Balansa*, n. 659.

In this specimen the spines are approximate, thick, horizontally spreading, 1 to $1\frac{1}{4}$ inch long, bearing numerous fascicles of leaves larger than those described by M. Dunal; they are from 4 to 6 lines long, 1 line broad: the peduncles are 2 lines long; the calyx, slightly pubescent, is 1 line; the tube of the corolla, quite glabrous, is 6 or 7 lines long; the lobes of the border are nearly orbicular, smooth, and 1 line long; the filaments are quite smooth, and fixed in the middle of the tube; two of the anthers reach the mouth, one is shorter, and the two others are a little exserted: the style attains the length of the lower anther†.

6. *Lycium halophyllum*, Welw. MSS. n. sp.;—fruticosum, nunc 2-pedale, nunc vix 2-unciale, glaberrimum, ramulis virgatis, costato-angulatis, inermibus vel spinosis: foliis subfasciculatis, valde polymorphis, oblongis, utrinque acutiusculis, vel obtusis et spathulatis, crassissimis, glabris, vix petiolatis; floribus solitariis, calyce tubulari, 5-dentato, pedicello subæquilongo, corollæ glabræ laciniis rotundatis, tubo infundibuliformi 6to brevioribus.—Lusitania.—*v. s. in herb. Hook.; ad rupes maritimas prope* Lagos et Cabo S. Vicente (*Welwich. herb. Algarv.* n. 717).

A very distinct species, varying greatly in its height, form, and aspect, and in the size and shape of its fleshy leaves: those

* For a drawing and detail of this species see plate 64 D.
† A drawing with details of this species is shown in plate 64 E.

of the shorter plants are more fleshy and spathulate, 3 or 4 lines long and 1 line broad; the larger plants have straight branches, with spines $\frac{3}{4}$ to $1\frac{1}{2}$ inch long, with leaves 5 or 6 lines in length and 2 or 3 lines in breadth; the peduncles are 1 line long; the calyx, of the same length, is narrow, tubular, with five short equal ciliate teeth; the corolla is narrow, slightly funnel-shaped, a little curved, smooth, 5 lines long, with five nearly orbicular segments, $\frac{3}{4}$ line long, with ciliate margins; the filaments are smooth, inserted below the middle of the tube, two of them reaching the mouth, two somewhat shorter, with the fifth intermediate*.

7. *Lycium orientale* (n. sp.);—ramulis griseis, substriatis, virgatis, spinosis, spinis longis, gemmiferis; foliis fasciculatis, aut alternis, lineari-spathulatis, in petiolum gracilem attenuatis, glaberrimis, aut pubescentibus; floribus solitariis, pedicello calyce tubuloso subæqualiter 4–5-dentato ciliato 2plo longiore; corollæ glabræ laciniis brevibus 4–5 oblongis, margine subciliatis, tubo anguste cylindrico superne paullo latiore 4to brevioribus, staminibus inclusis, 4-5, subæqualibus, filamentis glabris, tubo 4to brevioribus, antheris oblongis, basi cordatis, apice connectivo excurrente mucronatis, faucem attingentibus; stylo elongato, capillari, apice incurvo, exserto.—Asia Minor et Arabia.—*v. s. in herb. Hook.* Smyrna. Arabia Petræa (*E. Boissier*).

This species is probably common throughout the Levant, but has been confounded with *L. Europæum* and *L. Barbarum*, from both of which it is quite distinct. The two specimens above cited differ much in appearance, the Smyrna plant having much larger, linear, subulate, veinless leaves, generally alternate, somewhat thinner in texture and quite smooth: that from Arabia has shorter, spathulate, crisp, fasciculate, pubescent leaves, and sometimes tetramerous flowers, but in the form of the calyx, the length of the tube of the corolla, the shape and size of the segments of its border, the very short similar glabrous stamens, with singularly mucronate anthers, the two specimens quite agree. The latter plant has quite the habit and appearance of *L. Barbarum*, but it differs in the greater length of the tube of the corolla, its shorter and entirely smooth stamens and mucronate anthers. The Smyrna specimen greatly resembles *L. Europæum* in appearance; its leaves are 12 to 15 lines long, 2 lines broad; the pedicel is 2 lines long, the calyx 1 line, the tube of the corolla $5\frac{1}{2}$ lines, its segments $1\frac{1}{4}$ line. In the Arabian plant the leaves are 3 to 5 lines long, 1 line broad, obtuse, slightly pubescent; the peduncle is 2 lines long, the narrow tubular calyx often

* This species with analytical details is shown in plate 64 F.

1½ line long, the tube of the corolla 4½ lines, the segments 1 line, and the filaments are barely a line in length*.

8. *Lycium Persicum* (n. sp.) ;—glaberrimum, ramulis valde nodosis, breviter spinosis ; foliis spathulato-obovatis vel oblongis, in nodis glomerosis fasciculatis ; floribus solitariis, calyce parvulo, tubuloso, subæqualiter 5-dentato, margine ciliato ; corolla violacea, glabra, longe et anguste tubulosa, superne paullo ampliata, limbi laciniis 5, ovatis, margine subciliatis, tubo sexto brevioribus, staminibus 5, medio insertis, glabris, 2 brevissimis, 2 fauce vix exsertis, 1 intermedio incluso ; stylo tenui, stigmate exserto.—Arabia.—*v. s. in herb. Hook.* (Aden, *in maritimis,* Dr. Hooker) ; (*idem, Dr. T. Thomson*).

Near *L. orientale,* but much more gnarled and stunted in its growth ; its corolla more slender, its stamens very unequal in length, and its anthers not furnished with the same long mucronate point. Its branches are somewhat flexuose, with rather close internodes, and a spine grows out of each salient node : the leaves are 3 to 9 lines long, ½ to 2 lines broad ; the peduncle is 2 lines, the calyx 1 line, the tube of the corolla 5 lines, its segments ¾ to 1 line long : the shorter stamens are 1 line, the intermediate 2 lines, the longer ones 2½ lines in length : the flowers are "blue purple"†.

** *Filamenta basi hirsuta.* **Sp. 9 ad 14.**

9. *Lycium Austrinum* (n. sp.) ; (an *L. oxycarpum, var. α. grandiflorum,* Dun. in DC. xiii. 518 ?)—ramosum, inerme, vel rarius breviter spinosum ; ramulis tortuosis, subnitidis, grosse nodosis, nodis approximatis, creberrime foliosis ; foliis 5–20 e nodis fasciculatis, glaberrimis, longe lanceolatis, obtusis, vel acutiusculis, in petiolum tenuem spathulatis ; floribus e fasciculis 2–5, pedunculis folio brevioribus, calyceque tubuloso 4–5-dentato 3plo longioribus ; corolla majuscula, tubulosa, subincurva, imo crassa, coarctata, glabra, intus paullo infra insertionem staminum pubescente, limbi laciniis 5 rotundatis, nervosis, glabris, tubo 6–8vo brevioribus, staminibus valde inæqualibus, filamentis e quarta parte tubi orientibus, imo geniculatis et glabris, mox longiuscule hirsutis, dein glabris, filiformibus, 2 longioribus longe exsertis, 2 intermediis faucem attingentibus, 1 multo breviori inserto ; stylo filiformi, apice crassiusculo, incurvo, exserto.—In Africa Australi.—*v. s. in herb. Hook.* Gamka River (*Burke*).

A plant with large conspicuous flowers like those of *L. Afrum,*

* A drawing with details of this species is shown in plate 65 A.
† This species with analytical details is delineated in plate 65 B.

but narrower and paler; the leaves are much larger and more crowded; it differs moreover, essentially, in the structure of the flowers. The leaves are comparatively thin in texture, veinless, nearly an inch long, including the slender petiole, and $1\frac{1}{2}$ to 2 lines broad; the peduncles are 6 lines long; the tubular calyx 2 lines, the tube of the corolla 8 or 9 lines, the segments are 1 to $1\frac{1}{2}$ line long*.

10. *Lycium hirsutum*, Dun. in DC. Prodr. xiii. 521.—C. B. S.—*v. s. in herb. Hook.* (*Drège*, 7866 *b*). Graham's Town (*Rutherford*).

This is well distinguished by the rather dense pubescence which clothes the stemlets, the spines and the leaves. In Drège's specimen the leaves are elliptic, oblong, acute, attenuated at the base into a slender petiole of one-third the length of the blade; the total length being 9 to 12 lines, and their breadth 3 or 4 lines. The specimen from Graham's Town is much more branched, the branchlets and spines are nearly at right angles and densely beset with clusters of leaves: here the petiole is nearly obsolete, the leaves are only 3 or 4 lines long and $1\frac{1}{2}$ or 2 lines broad: the flowers, upon an extremely short peduncle, are nearly sessile: the tubular and very pubescent calyx is larger than in the other specimen, its tube being 2 lines, and its nearly equal linear teeth being widely spread and 1 or $1\frac{1}{2}$ line long: the tube of the corolla is 4 lines long, nearly cylindrical, with a border of five rounded oblong segments, ciliated on the margins, nearly a line in length: the stamens are nearly equal in length, inserted considerably below the middle of the tube, hirsute for about one-fourth their length, and reach the mouth: the flowers in this specimen are in a bad condition†.

11. *Lycium arenicolum* (n. sp.);—spinosum, glaberrimum, ramis costato-angulatis, ramulis superioribus elongatis, subvirgatis, inferioribus in spinis nodosis abbreviatis, nodis osseis, nitidis, cupulatis, utrinque lateraliter in costis decurrentibus; foliis creberrime fasciculatis, sessilibus, linearibus, carnosulis, acutis; floribus 4-meris e fasciculis solitariis, brevissimis, pedunculatis, calyce inæqualiter 4-dentato, dentibus ciliatis; corolla parva, tubulosa, limbi laciniis 4 oblongis, ciliatis, tubo tertio brevioribus; staminibus inæqualibus, paullo supra basin insertis, 1 parum exserto, 2 faucem attingentibus, quarto breviori incluso, filamentis basi hirsutulis; ovario induvio corollæ circumdato, et disco carnoso rubro arcte adnato suffulto; stylo apice in-

* A figure of this species with sectional details is given in plate 65 C.
† This species with sectional drawings is represented in plate 65 D.

crassato exserto.—C. B. S.—*v. s. in herb. Hook.*; *in arenosis ad* Orange River (*Burke*).

This plant has greatly the habit and appearance of *L. tenue*, and is remarkable for the cupular nodes that project from the axils, and that are decurrent on each side with the angles of the stem: five to ten leaves grow out of each node, and are 5 to 7 lines long, ½ line broad: the peduncle is barely longer than half a line, the calyx 1 line, the teeth of the corolla 2½ lines, the segments of the border ½ line long*.

12. *Lycium oxycladum* (n. sp.);—ramosissimum, glaberrimum, ramis patentibus, ramulisque angulatis, longiusculis, apice spinosis, nodis approximatis, osseis, cupulatis; foliis parvulis, 4–7 hinc creberrime fasciculatis, spathulato-linearibus, carnosulis; floribus e fasciculis solitariis, breviter pedunculatis, calyce glabro, poculiformi, subæqualiter 5-dentato, dentibus acutis subciliatis, corollæ tubo infundibuliformi glabro, imo intra calycem piloso, limbi laciniis ovatis, tubo 4–5to brevioribus, margine haud ciliatis, staminibus non longe a basi insertis, filamentis imo glabriusculis, dein longiuscule hirsutulis, superne glabris, 2 longioribus exsertis, 2 medianis faucem attingentibus, quinto breviori incluso.—C. B. S.—*v. s. in herb. Hook.* Uitenhage (*Harvey*, 81). South Africa (*Burke*).

A plant with much the habit of *L. tetrandrum*, but with more fleshy and broader leaves: the leaves are 3 or 4 lines long, ½ line broad; the pedicel is 1½ line, the calyx 1 line in length, the tube of the corolla 3 or 4 lines, the segments of the border roundish or oval, ¾ line long†.

13. *Lycium roridum* (n. sp.);—viscoso-roridum, spinosissimum, intricato-ramosum, ramis fuscis, glaucis, striatulis, nodosis, flexuosis, ramulis spinosis; foliis parvulis, 2–10 creberrime fasciculatis, spathulato-oblongis, vel ovatis, carnosis, pallide glaucis, glandulis minutissimis viscosis utrinque punctatis, pilisque brevissimis sparse scabridis vel interdum glabriusculis; floribus in medio fasciculorum solitariis, pedunculatis, calyce subtubuloso, æqualiter profunde et acute dentato, carnoso, punctis glandulosis pilisque brevissimis munito, corollæ tubo infundibuliformi glabro, limbi laciniis ovatis, tubo 4to brevioribus; staminibus infra medium insertis, imo pilis articulatis longiusculis dense lanatis, hinc superne glabris, inæqualibus, omnibus exsertis, bacca globosa, parva, pallida, mucronulata, calyce cupulato, dentibus recurvis suffulta.—In Africa Australi.—*v. s. in herb. Hook.* (*Burke*).

* A drawing of this species with analytical details is shown in plate 65 E.
† An outline of this species with floral details is seen in plate 65 F.

This plant, from its close external resemblance, would readily be confounded with *L. oxycladum*, but on careful examination it will be found extremely different. The fleshy leaves are 1 or 2 lines long, ½ line broad, cuneate below, with numerous yellowish immersed shining glands on both surfaces; the peduncle is 1½ line long; the tube of the calyx is equal in length to the five equal erect divisions, which are ¾ line long; the tube of the corolla is 2½ lines; the segments of its border ½ line long; the berry is nearly 2 lines in diameter, 2-celled, containing eight glaucous-brown, oval, compressed, and somewhat cochleate seeds; these are affixed to the lower portion of the dissepiment, which is membranaceous, and slit in the middle of the upper portion, as in the *Duboisieæ**.

14. *Lycium acutifolium*, E. Meyer; Dunal in DC. Prodr. xiii. 519.—Pro char. floral. a cl. Dunalio donato, substit.: calycis dentibus æqualibus, brevibus, acutis, ciliatis, corollæ glabræ laciniis 5 ovatis, tubo superne valde ampliato, basi angustissimo, 4to brevioribus, glabris, staminibus inæqualibus haud procul basin insertis, imo longiuscule hirsutis, superne glabris, 2 longe, 2 paullo exsertis, quinto multo breviori incluso; stylo exserto.—C. B. S.—*v. s. in herb. Hook.* (*Drège sub nomine L. acutifolium b. E. M.*)

A very distinct species, remarkable for its thin, membranaceous, spathulate, oval, fasciculated leaves, and its very long peduncle. The leaves are 3 or 4 lines long, 1¼ to 2 lines broad, attenuated at base into a slender petiole; the very smooth peduncle is 6 lines long; the calyx is 1 line; the tube of the corolla, contracted below, is in its upper portion subcampanulate, 3 lines in length; the segments of the border being 1 line long†.

*** *Filamenta paullo supra basin glabra, mox globula pilorum donata.* Sp. 15 ad 22.

15. *Lycium Afrum*, Linn.; Dun. in DC. Prodr. xiii. 521, cum aliis synonymis et citationibus auctorum.—Pro char. flor. cl. Dunalii substitut. sequent.;—calyce glabro, sæpe margine flosculoso-puberulo, majusculo, campanulato, æqualiter ac breviter 5-dentato, demum 2–3-fido; corolla conspicua, infundibuliformi-campanulata, imo breviter coarctata, glabra, limbi laciniis 5, subrotundis, tubo 5to brevioribus, reflexis; staminibus subæqualibus, inclusis, faucem non attingentibus, filamentis imo geniculatis, nudis, mox fasciculo pilorum donatis, dein superne glaberrimis.—Africa, præsertim in C. B. S.; an in Africam Borealem, Hispaniam, et Lusitaniam introductum?

* This species with full details is shown in plate 66 A.
† A drawing of this species with details is seen in plate 66 B.

—*v. s. in herb. plurimis,* C. B. S.; *inter alia, spec. coll. Drège* (*sub nomine L. rigidum, b. Thunb.*).

This is a well-known species, long cultivated in Europe, conspicuous for its large crimson flowers and copious small foliage. The specimen above quoted from Drège's collection, and described by M. Dunal in the 'Prodromus,' p. 523, as *L. rigidum, var. angustifolium,* Dun., appears to me without doubt a true *L. Afrum.* Specimens from different parts of Southern Africa vary in the length and thickness of their crowded fasciculate leaves, and the species is easily distinguished from all others by its broad calyx and large dark-coloured corolla. The species *L. propinquum* (DC. Prodr. xiii. 526) was founded by G. Don (Dict. iv. 459) simply upon Thunberg's description of *L. Afrum* in 'Linn. Trans.' ix. 153: here, the words "folia unguicularia" are translated, "leaves a nail long," which M. Dunal has reconstrued into "folia $2\frac{1}{2}$ pollicaria:" to me it appears that Thunberg meant to express the essential feature of unguiculate or spathulate leaves: under this more probable construction there is absolutely nothing in Thunberg's character at variance with what we know of *L. Afrum**.

16. *Lycium carnosum,* Poir.; Dunal in DC. Prodr. xiii. 522.—C. B. S.; an *L. Afri* mera varietas?

Not having met with any specimen of this reputed species, I cannot form a decided opinion respecting it, but from the published descriptions, no very essential difference is appreciable between this and the preceding species: the principal distinction, and that derived from cultivated specimens, consists in its somewhat smaller berry being of a deep blue, while the other is of a blackish red colour, a mere difference of shade. M. Dunal, from a specimen cultivated at Montpelier, says it is very close to *L. Afrum,* differing only in its smaller stems, fewer spines, thicker, shorter and paler leaves, and in a more greenish hue in the colour of the corolla: a considerable difference in both these respects is often witnessed in indigenous specimens of *L. Afrum*: it does not therefore appear, that the validity of the species rests upon very satisfactory grounds; and this is confirmed by the fact, that among the numerous collections brought from all parts of the Cape colony during the last few years, no specimen appears that can be referred to this species.

17. *Lycium glaucum* (n. sp.);—spinosum, glaberrimum, intricato-ramosum, ramulis rugoso-rimosis, vel lævigatis, junioribus niveis, spinis sæpius brevibus, nudis, ex axillis strumoso-

* An outline of this species with its floral analysis is shown in plate 66 C.

nodosis; foliis e nodis 5–10, fasciculatis, angustissime linearibus, carnosulis, glauco-pallidis; floribus in fasciculis solitariis, folio paullo longioribus; pedunculo calyce tubuloso glabro membranaceo breviter et inæqualiter 5-dentato demum fisso subduplo longiore; corolla glabra, infundibuliformi, pallide flava, imo coarctata, limbi laciniis oblongis, obtusis, reticulato-pictis, tubo tertio brevioribus; staminibus 5, subæqualibus, exsertis, filamentis gracilibus, imo breviter pilosis, 2 paullulo longioribus, tubo fasciculis totidem pilorum cum insertione istorum alternis intus donato; stylo capillari, apice inflexo, exserto.—In Persia boreali.—*v. s. in herb. Hook.* (*Aucher Eloy, n.* 5035).

This is a plant of very gnarled aspect, with prominent warty nodes, of a pale glaucous hue, and with pale flowers half the size of those of *L. Afrum*. It is very distinct from *L. Barbarum*, with which it has probably been confounded. Its leaves are from 5 to 7 lines long, $\frac{1}{4}$ or $\frac{1}{2}$ line broad; the peduncle is 3 lines in length; the narrow tubular calyx is $1\frac{1}{2}$ or 2 lines long, 1 line in diameter; the tube of the corolla measures 4 lines, and the segments of its border $1\frac{1}{2}$ line, and, excepting the five tufts of hair placed alternately with the stamens, between their insertion, it is quite glabrous*.

18. *Lycium echinatum*, Dun. in DC. Prodr. xiii. 513.—Ad char. cl. Dunalii post descr. calycis, adde;—corolla infundibuliformi, pallida, 4-mera, imo coarctata, limbi laciniis rotundis, margine ciliatis, tubo 4to brevioribus; staminibus 4, quorum 2 alternatim longioribus, exsertis, alteris faucem attingentibus, filamentis supra coarctationem tubi glabri insertis, hinc nudis et geniculatis, mox fasciculo pilorum donatis.—C. B. S.—*v. s. in herb. Hook.* (*Drège*, 7870).

The specimen above cited is quite fragmentary, and is remarkable for the extreme smallness of its fasciculate leaves: the branchlets appear angular and glaucous, with a few short spines, and out of each nodose axil arises a fascicle of small narrow linear leaves, 1 line, rarely 2 lines long, and $\frac{1}{4}$ line broad: out of the midst of these a single flower is seen, the peduncle being 1 line in length; the calyx with four small equal teeth is 1 line long; the tube of the corolla is 2 lines, with four orbicular segments $\frac{1}{2}$ to $\frac{3}{4}$ line long: the insertion of the stamens is at a point one-fourth from the bottom of the tube, which is quite glabrous, excepting a few ciliate hairs on the margin of the segments†.

* This species with analytical details is seen in plate 66 D.

† A representation of this plant with its floral analysis is given in plate 66 E.

19. *Lycium tetrandrum*, Thunb. Linn. Trans. ix. 154. tab. 15; Dunal in DC. Prodr. xiii. 516. Lycium horridum, *Thunb. loc. cit.* 152. tab. 17; *Dunal, loc. cit.* 516;—intricato-ramosissimum, spinosum, ramulis patentibus, nodulosis, foliis e nodis fasciculatis, obovatis, vel elliptico-oblongis, basi in petiolum brevissimum attenuatis, crassiusculis, glabris; floribus 4-meris in fasciculis solitariis, pedunculo brevissimo, calyce poculiformi, glabro, 4-costato, 4-dentato, dentibus brevibus ciliatis, corolla glabra, infundibuliformi, limbi laciniis rotundatis, margine ciliatis, tubo 4to brevioribus; staminibus 2 longioribus exsertis, 2 alternis faucem attingentibus, filamentis longe supra medium insertis, hinc geniculatis, nudis, et cum fasciculis totidem pilorum tubo adnatis alternis, mox globula pilorum donatis, superne glabris.—C.B.S.—*v. s. in herb. Hook.* (*Drège*, 7872).—Uitenhage (*Harvey*, no. 865).—*In herb. meo*, Uitenhage (*Harvey*, no. 1034, *sub nomine Lycium horridum*).

Upon the same sheet in Sir Wm. Hooker's herbarium I find four specimens of Drège's collection, all fragments and very bare of leaves; two of these agree with the figure of Thunberg's *L. tetrandrum*; the others, evidently younger branchlets, answer to his *L. horridum*, the structure of the flowers being exactly alike in both. I cannot perceive, in the copious descriptions of these two species by M. Dunal above quoted, anything that can constitute valid differential characters; we may therefore consider them as identical, as Sprengel long ago determined (Syst. i. 700). The older leaves are fleshy, 3 lines long and $\frac{1}{2}$ line broad; the younger leaves are obovate, 2 lines long: in Dr. Harvey's specimen the leaves are obovate, spathulate, 7 lines long, $2\frac{1}{2}$ lines broad; the peduncle is $1\frac{1}{2}$ line, the calyx 1 line, the tube of the corolla 3 lines, the segments of its border $\frac{1}{2}$ or $\frac{3}{4}$ line long*.

20. *Lycium tenue*, Willd.; Dunal in DC. Prodr. xiii. 515.—Pro char. flor. cl. Dunalii substit.;—pedunculo calyce paullo longiore, calyce glabro, tubuloso, reticulato, subæqualiter 5-dentato, dentibus brevibus ciliatis; corollæ tubo infundibuliformi imo coarctato, calyce 3plo longiore, limbi laciniis 5 erectis, tubo 3plo brevioribus, lævibus, staminibus valde inæqualibus, infra medium tubi insertis, 2 longioribus multo exsertis, 1 mediano faucem attingente, 2 brevioribus inclusis; filamentis imo glabris et geniculatis, mox fasciculo globoso pilorum barbatis, inde glabris.—C. B. S.—*v. s. in herb. Hook.* (*Drège, sub nomine L. tenue.*)

* An outline of this species and section of its flower is shown in plate 66 F.

This is a mere fragmentary specimen, agreeing sufficiently with Willdenow's description, but whether it be identical with the original, or it be the same as that described by M. Dunal, I have no means of judging. The foregoing diagnosis is therefore only founded upon Drège's plant above mentioned: it consists of a branchlet 5 inches long, with spinous axils $\frac{1}{4}$ inch apart; the spines are slender, bare, 3 or 4 lines long, each springing out of a crowded fascicle of leaves, which are spathulately linear, 3 to 5 lines in length and $\frac{1}{3}$ line broad; a single flower arises out of each fascicle, the peduncle being 2 lines long; the smooth calyx is $1\frac{1}{2}$ line long, with five short rather equal teeth; the tube of the corolla is 3 lines long, and the oblong segments of its border 1 line*.

21. *Lycium cinereum*, Thunb. Trans. Linn. Soc. ix. 152. tab. 16; Dunal in DC. Prodr. xiii. 516. Lycium apiculatum, *Dun. loc. cit.* 517. Acocanthera Lycioides, *G. Don.* Cestrum Lycioides, *Licht.*—C. B. S.

With these plants I am wholly unacquainted, but from the descriptions quoted, no specific difference is perceptible between them, as was suggested by M. Dunal himself.

22. *Lycium pendulinum* (n. sp.);—ramosum, ramulis gracilibus, pendulinis, annotinis strumoso-nodosis, subnudis, apice spinosis, junioribus foliosis, foliis e cupula ossea axillari fasciculatis, linearibus, acutis, in petiolum tenuem imo angustatis, eveniis, glaberrimis; flore e fasciculo solitario, pedunculo gracili, calyce 4plo longiore, calyce tubuloso, breviter ac subæqualiter 5-dentato, corolla infundibuliformi, imo intra calycem coarctata, et extus pilosa, superne glaberrima, limbi laciniis oblongis, venosis, tubo 4plo longioribus, staminibus inæquabilibus, uno longiore exserto, 2 faucem attingentibus, 2 brevioribus inclusis: filamentis supra coarctationem tubi insertis, hinc nudis et geniculatis, mox fasciculo globoso pilorum munitis, superne glabris; stylo filiformi, exserto.—C. B. S.—*v. s. in herb. Hook. sub nom. L. Afrum var. pendulum*, N. ab E.

This plant accords more with *L. tenue*, Dun., than with *L. tenue*, Willd.; its branches are very slender and pendulous: the leaves are 4 or 5 lines long, $\frac{1}{2}$ line broad; the peduncle is 3 lines long; the tubular calyx 2 lines, with five short erect teeth; the corolla is 3 lines long, and the oval segments of its border $\frac{1}{3}$ to $\frac{1}{4}$ of its length†.

* This species, with sectional drawings, is seen in plate 67 A.
† This plant, with floral details, is shown in plate 67 B.

B. Neogeæ.

* *Filamenta lævia.* Sp. 23.

23. *Lycium pallidum* (n. sp.);—ramosum, ramulis tortuosis, subnitidis, fusco-rufescentibus, grosse nodosis, breviter spinosis, creberrime foliosis, foliis e nodis fasciculatis, glaberrimis, spathulato-oblongis, obtusis, imo in petiolum tenuem angustatis, utrinque alutaceo-glaucis, carnosulis, eveniis; floribus majusculis, in fasciculis binis, folio æquilongis, calyce pedicello paullo breviori, poculiformi, carnosulo, glabro, lacinulis 5 lineari-acutis, tubo æquilongis, patentibus; corolla pallide ochroleuca, tubo cylindrico, supra medium infundibuliformi, limbi laciniis 5, rhomboideo-ovatis, tubo 4to brevioribus: staminibus 5, subæquilongis, longe exsertis, filamentis glaberrimis, medio tubi insertis, hinc geniculatis, et in nervis totidem pilosis ad imum decurrentibus, antheris ovatis, profunde cordatis, connectivo apice in mucrone excurrentibus: stylo filiformi, longe exserto, stigmate clavato, sub-2-labiato.—In Nova Mexico.—*v. s. in herb. Hook.* (*Fendler*, n. 670).

This species bears greatly the habit of *L. Austrinum*, but has a far more pallid aspect: the spines are barely more than 2 inches long; the nodes are large and prominent, and from each of them arises a fascicle of three to ten leaves, $1\frac{1}{4}$ inch long, $\frac{1}{4}$ inch broad: the pedicels are 3 lines long; the calyx $2\frac{1}{2}$ lines, fleshy, somewhat bell-shaped, and divided half-way into five equal, pointed divisions, which are considerably spreading: the tube of the corolla is 8 lines long, is contracted to a diameter of $\frac{1}{2}$ a line in its lower moiety, while the upper half expands gradually to a diameter of 3 lines in the mouth: the segments of the border are short, broad, obtuse, somewhat rhomboidal, 2 lines long and $2\frac{1}{2}$ lines broad, and as well as the tube are marked with branching nervures; it is quite glabrous, except in the prominent ribs that extend from the base to the point of insertion of the glabrous filaments in its middle: the stamens reach nearly to the extremity of the segments, one however is a little shorter than the others; the anthers, of a deep red colour, are cordate at the base, attached along their upper moiety to an intervening connective, which is excurrently and curvedly mucronate at the apex, as in *L. orientale*; the style is filiform, of a reddish colour, curved above, and extends $\frac{1}{4}$ inch beyond the stamens; the stigma is deeply 2-lobed*.

** *Filamenta pilosa.* Sp. 24 ad 35.

24. *Lycium fragosum* (n. sp.);—fruticosum, ramosum, ramulis cortice fusco rimoso, axillis grosse nodosis, nodis breviter spi-

* An outline of this plant, with floral analysis, is given in plate 67 C.

nosis, foliis e nodis fasciculatis, anguste linearibus, margine revoluto subtus quasi 3-costatis, utrinque glanduloso-rugosis; floribus e fasciculis solitariis, pedunculo capillari folio æquilongo, calyce scabrido, urceolato, ad medium lacinulis 4 acutis erectis partito, corolla glabra, anguste cylindrica, superne paullulo infundibuliformi, calyce 6plo longiori, limbi laciniis 4, brevibus, rotundatis, margine ciliatis, tubo 7mo brevioribus, staminibus 4 inclusis, 1 paullo longiori, filamentis infra medium tubi insertis, hinc longiuscule pilosis, superne glabris, tenuibus; stylo longitudine staminum, stigmate clavato, 2-lobo.—Peru.—*v. s. in herb. Hook.* (*Cuming*, 948).

This forms a very distinct species, with rugous knotty branches and naked spines, 2 lines in length, springing out of the nodes: there are five to ten leaves in each fascicle, 4 or 5 lines long, and $\frac{1}{4}$ line broad: the slender peduncle measures 4 lines; the somewhat tubular calyx is $1\frac{1}{2}$ line long, half cleft into four narrow, acute, equal segments, each separated by a rounded sinus; the tube of the corolla is 5 lines long, $1\frac{1}{2}$ line in diameter at its broadest part, the lobes of the border being only $\frac{3}{4}$ line; the filaments are inserted into the tube at a distance of a quarter of its length from the bottom, and are pilose at base for one-fourth of their length*.

25. *Lycium implexum* (n. sp.);—fruticosum, intricato-ramosum, ramis ramulisque rimoso-rugosis, ochraceis, glabris, ramulis nodosis, apice spinescentibus, spinisque axillaribus brevibus aciculatis armatis; foliis e nodis fasciculatis, minimis, cuneato-oblongis, carnosis, utrinque aspero-pilosis, floribus e fasciculis approximatis, solitariis, pendulis, pedunculo folio calyceque æquante; calyce parvo, pubescente, æqualiter 4-dentato, corolla pallida, elongata, anguste cylindrica, superne infundibuliformi, extus glabra, intus ad medium pubescente, limbi laciniis 4, brevibus, rotundis, lævibus, tubo 5to brevioribus, staminibus 4 capillaribus, subæqualibus, longe exsertis, infra medium tubi insertis, pro dimidio inferiori molliter pubescentibus, superne lævibus, pro tertia parte exsertis, stylo longitudine staminum.—Chile, ad Coquimbo.—*v. s. in herb. Hook. et Lindley* (*Bridges*, n. 1334).

This very distinct plant bears greatly the aspect of several species of the genus *Alona*, and of *Phrodus*, which I have before described (*huj. vol.* p. 24), all collected in the same neighbourhood, and at the same time, by Mr. Bridges, as their respective numbers will show. The branches and branchlets are very knotty and intricately crossed; the prominent, nodose axils, scarcely

* This species, with sectional details, is represented in plate 67 D.

3 lines apart, have a fascicle of four to eight leaves springing from them, and many are furnished with a short needle-formed spine. The leaves are spathulately oblong, obtuse, fleshy, glaucously pubescent on both sides, with short, rigid, erect hairs; they are 1 or $1\frac{1}{2}$ line long, and scarcely more than $\frac{1}{4}$ line broad: the peduncle, often deflexed, is 1 line long, and about the same length as the pubescent calyx, which is divided half-way into four linear, obtuse, erect teeth: the corolla is 5 or 6 lines long, $\frac{1}{4}$ line broad towards the base, but swelling to $\frac{1}{2}$ line in diameter at its mouth, the four smooth, almost orbicular lobes of the border being about $\frac{3}{4}$ line diameter; the capillary filaments are inserted into the tube at a distance of one-third of its length from the base; they are 4 lines long, and are pubescent for two-thirds of their length, the inner surrounding portion of the tube being also pubescent for about the same distance. This species, although with acicular spines, will be seen to be extremely different from *L. rachidocladum*, described by M. Dunal from the same locality*.

26. *Lycium minutifolium*, Remy in Gay Hist. Chile, v. 93; Walp. Ann. iii. 173;—ramosissimum, ramulis spinescentibus; foliis fasciculatis, minutissimis, ovatis, obtusis, hirsutis, pedunculis axillaribus, solitariis, calyce 4-dentato, vix puberulo, corolla anguste tubulosa, longiuscula, apice vix dilatata, limbo 4-fido, staminibus vix exsertis.—Chile.

From the above description we may infer that this plant bears much analogy with the preceding, apparently differing in its ovate leaves and scarcely exserted stamens.

27. *Lycium stenophyllum*, Remy, *loc. cit.* p. 94;—spinescens, ramosum; foliis fasciculatis, inæqualibus, linearibus, crassiusculis, obtusis, pubescentibus, 3 lin. longis; floribus solitariis, axillaribus, calyce 4-fido, pubescente, segmentis oblongis, obtusis; corolla tubulosa.—Chile.

From the above description it is not clear to which section this species belongs; but from its 4-merous flowers and its habit, it is probably nearly allied to the two preceding species.

28. *Lycium cestroides*, Schl. Linn. vii. 70. Acnistus cestroides, *nob. Ill. So. Am. Pl.* i. 23; *Dun. in Prodr. DC.* xiii. 500;—breviter spinosum, ramis subflexuosis, albescentibus, junioribus pubescentibus, ramulis brevibus, floriferis, apice spinosis; foliis alternis, ellipticis, oblongis, apice acuminatis, imo cuneatis, margine subreflexo obsolete crenulato puberulo, nervosis, utrinque subglabris et minutissime rugulosis, sub lente

* A representation of this plant, with details, is given in plate 67 E.

glanduloso-scabridis, subtus pallidis, petiolo tenui, longiusculo, canaliculato, puberulo : floribus pedunculatis, calyce tubuloso pallide membranaceo, lineis 5 viridibus late costatis signato, pubescente, 5-dentato, dentibus acutis, erectis, intus margineque albido-lanatis ; corolla longe tubulosa, imo angustiore, calyce 5plo longiore, glabra, limbi laciniis 5, rotundis, margine densissime albo-fimbriatis, erectis, valde imbricatis ; staminibus 5, inæqualibus, inclusis, medio tubi insertis, 2 longioribus faucem vix attingentibus, imo pubescentibus, ovario oblongo, corollæ circumscissæ reliquo induto, stylo incluso, apice incrassato.—Banda Oriental et Tucuman.—*v. s. in herb. Hook.* Santiago del Estero (*Tweedie*)*.

This species was formerly referred by me to *Acnistus* (*loc. cit.*) on account of its shrubby habit, large leaves, and crowded fasciculate or umbellate flowers, the lobes of the corolla having woolly margins ; but my knowledge of it was then only derived from Schlechtendal's description. Since that time I have seen a specimen of a plant, evidently referrible to the same species, which at a first glance bears more the aspect of an *Acnistus* or a *Cestrum*, than a *Lycium* : on closer inspection, it will be found that the flowers are only crowded, by the close approximation of the axils. The lobes of the border are not tomentose, as in *Cestrum* or *Acnistus*, but densely ciliated, and have a very decided imbricated æstivation ; these circumstances, together with the structure of the stamens, and the cupular induvium of the corolla that surrounds the ovarium, mark unquestionably the genus to which it really belongs. Tweedie's plant, although from a somewhat distant locality, is evidently the same species as Sellow's ; both may be said to grow within the same region. It appears to be a very frondose shrub, with large leaves, and generally unarmed ; but sometimes it bears short spines in some of its upper floriferous axils. The leaves are alternate ; and their axils produce in the following year short branchlets, with very approximate leaflets, which assume somewhat the appearance of fasciculated clusters. The younger leaves are pubescent, upon long slender petioles ; but as they grow older, they become glabrous, except at the base and on the petiole, where by a lens the remaining pubescence is always distinguishable. The larger leaves measure $3\frac{1}{2}$ inches in length, including the petiole of 5 lines, upon which the narrowing base of the blade is somewhat decurrent ; they are 10 lines broad : other leaves vary from $1\frac{1}{2}$ to $2\frac{1}{2}$ inches in length, and 7 to 9 lines in breadth. Schlechtendal describes the leaves as having short petioles ; but the difference is probably accidental, depending on the comparative breadth

* A figure of this species, with analytical details, is shown in plate 67 F.

of the decurrent portion of the blade on the petiole. The floriferous branchlets, often terminating in a spine, are $\frac{3}{4}$ to 1 inch long, and bear many small crowded leaves, and very numerous flowers in almost aggregated clusters. The peduncles are slender, somewhat thicker above, and 4 lines long: the calyx is tubular, $1\frac{1}{2}$ line long, with 5 acute, short, erect teeth, from which as many costate nervures descend to the base; the teeth, more especially, are covered with whitish pubescence. The corolla is cylindrical, slightly swollen below the mouth; the tube is 6 lines long, $1\frac{1}{2}$ line diameter in the broader part, and quite smooth; the lobes of the border are erect, orbicular, very small, $\frac{1}{8}$th the length of the tube, and are fimbriated on the margin with numerous ciliated white hairs: the stamens are enclosed; two of them nearly reach the mouth of the tube, the other three being little more than half their length; all are pilose for a short portion of their length, above the point of their insertion in the middle of the tube: the style is slender below, much thickened above the middle, slightly curved, and the length of the longer stamens: the stigma is clavate and sub-bilobed: the ovary is narrow, oblong, smooth, somewhat shorter than the calyx, and is invested at its base by the very short induvial cup of the corolla: Schlechtendal states that the berries are globose, red, and 3 lines in diameter.

29. *Lycium elongatum* (n. sp.);—glaberrimum, ramosum, ramulis elongatis, spinescentibus, nodoso-flexuosis, glauco-griseis; foliis 4–8, fasciculatis, lineari-subulatis, obtusiusculis, imo in petiolum gracilem longe attenuatis, carnosulis; floribus in fasciculis solitariis, pedunculo folio dimidio breviori, calyce brevi, tubuloso, 5-costato, acutissime 5-partito, corolla longe et anguste tubulosa, glabra, sicca rubescente, imo coarctata, superne vix infundibuliformi, limbi laciniis 5 breviter ovatis, staminibus brevissimis, inclusis, ultra medium insertis, glabris, in nervis totidem hirsutulis tubi decurrentibus, 3 longioribus faucem vix attingentibus, 2 alteris istis dimidio brevioribus; stylo corollæ tubo æquilongo.—Prov. Argentinas.—*v. s. in herb. Hook.*; *in desertis salsuginosis* intra Cordovam et Santiago de Tucuman (*Tweedie*, n. 1212).

This plant, although very different in its growth, has its flowers very similar to those of the preceding species. Tweedie remarks that this and similar species, all low-growing shrubs, abound here and in Patagonia in endless varieties; (by Patagonia he means the southern portion of the province of Buenos Ayres.) The leaves, including the petiole of one-half their length, are 4 to 6 lines long and $\frac{1}{2}$ line broad: the slender peduncle is $1\frac{1}{2}$ line long: the narrow, glabrous, tubular calyx, marked with deep red lines,

is $1\frac{1}{4}$ line long, and is half cleft into five acute linear teeth, having pubescent margins: the tube of the corolla is 4 lines long, its ovate lobes are barely $\frac{3}{4}$ line long, the three longer stamens are 1 line, the two shorter ones $\frac{1}{2}$ line in length*.

30. *Lycium fuscum* (n. sp.);—intricato-ramosum, spinosum, foliis glaberrimis, fasciculatis, late ovatis, in petiolum brevissculum attenuatis, eveniis, crassiusculis, glauco-viridibus, fuscis, utrinque glanduloso-rugosis, vel elevato-punctatis; floribus e fasciculis solitariis, breviter pedunculatis, calyce brevi, cupuliformi, breviter 4-dentato, corolla fusco-purpurea, longe tubulosa, subincurva, imo angustiore et sulcata, superne paullo ampliore, limbi laciniis 4, brevissimis, suborbiculatis, margine dense albo-fimbriatis, staminibus 4 inæqualiter exsertis, filamentis in coarctationem tubi insertis, hinc geniculatis et hirsutis, inferne in nervis totidem prominulis glabris deliquescentibus, superne lævibus, stylo staminibus multo longiore; bacca cærulescente, ovali, breviter apiculata, calyce suffulta.—In Andibus Provinciæ Mendozæ.—*v. v.* ad San Pedro de Uspallata.

I found this plant growing abundantly in the above-named portion of the Cordillera; unfortunately the only specimen gathered during my last rapid journey over the Andes was lost, but some of the leaves and flowers were preserved with the berries, collected at the same time. The leaves are somewhat fleshy, roundly oval, 3 lines long and 2 or 3 lines broad, suddenly narrowed into a short petiole 2 lines in length: the peduncle is 2 lines long; the cup-shaped calyx is $1\frac{1}{2}$ line long, with four short equal teeth; the tube of the corolla is $5\frac{1}{2}$ lines long, the lobes of the border $\frac{1}{2}$ line in diameter, and are remarkable for their fimbriated margins, as in *L. cestroides*†.

31. *Lycium confertum* (n. sp.);—intricato-ramosum, ramulis nodoso-flexuosis, spinosis, rarius inermibus, cortice cano, rimoso, spinis brevibus in axillis approximatis: foliis 6–10, valde fasciculatis, angustissime linearibus, in petiolum spathulatis, glaberrimis; floribus in fasciculis solitariis, breviter pedunculatis, calyce cylindrico, pilosulo, laciniis 5 subulatis, tubo æquilongis; corolla anguste tubulosa, vix infundibuliformi, imo coarctata, extus pubescente, imo in contractionem tubi annulo dense barbato cincta, limbi laciniis ovatis, glabris, tubo 7mo brevioribus, staminibus inæqualibus, inclusis, filamentis in medio tubi insertis, longiuscule hirsutis, superne lævibus, 2 longioribus faucem attingentibus, 2 vix æquilongis, 1 dimidio fere breviori, stylo exserto, bacca ovata, parvula,

* This species is delineated in plate 68 A.

† This plant with floral details is shown in plate 68 B.

coccinea, calyce suffulta.—In desertis salsuginosis Prov. Mendozæ et Sancti Ludovici.—*v. v. et spec. lexi; abundat in* Travesiam *a* Mendoza *usque ad* Coral de Desaguadero *et ad* Alto del Yeso, Prov. S. Luiz.

This species I found abundantly along the Desert track all the way from Mendoza to San Luiz. It varies in having the leaves more or less crowded, more or less attenuated; they are from 3 to 6 lines long, $\frac{1}{4}$ line broad; the peduncle is $1\frac{1}{2}$ or 2 lines long; the calycine tube is cylindrical, $\frac{3}{4}$ line long, with narrow, linear, acute segments $1\frac{1}{4}$ line long: the tube of the corolla is 4 or 5 lines long, the segments of its border are $\frac{3}{4}$ line long, the larger stamens are 2 lines in length: the oval berry is 3 lines long*.

32. *Lycium Berlandieri,* Dun. in DC. Prodr. xiii. 520.—Mexico, prope Laredo (*Berlandier*).

33. *Lycium senticosum* (n. sp.);—intricato-ramosum, ramis tortuosis, angulatis, griseo-helvolis, fere aphyllis, ramulis patentibus, apice spinosis, foliis e nodis cottoneis prominentibus paucis (2–3) fasciculatis, parvulis, lineari-spathulatis, obtusis, glabris; floribus solitariis, folio duplo longioribus, pedunculatis, glabris; calyce parvo, poculiformi, inæqualiter 4-dentato, dentibus acutis, tubo duplo brevioribus; corollæ pallide flavæ tubo imo coarctato, infra e medium repente ac late campanulato, limbi laciniis 4, curtissimis, tubo 4to brevioribus, rotundato-deltoideis, reflexis; staminibus 4 exsertis, 2 paullo longioribus, filamentis in coarctationem tubi insertis, hinc geniculatis et longiuscule hirsutis, superne capillaribus et glabris, stylo staminibus longiore.—Mexico, ad Monterey.—*v. s. in herb. Hook.* (*Berlandier*, Jan. 1828).

This is evidently very near *L. Berlandieri,* and may possibly be only a tetramerous variety of it. It appears to be more barren of leaves, which are smaller and fewer in each fascicle: the leaves are $2\frac{1}{2}$–3 lines long, $\frac{1}{2}$ line broad; the pedicels are 2–$2\frac{1}{2}$ lines long, the calyx is nearly a line long, the tube of the corolla 2 lines, the segment of the border $1\frac{3}{4}$ line in length; the contracted portion of the tube is narrow, and a little longer than the calyx, when it is suddenly enlarged into a bell-shaped form; the style is the length of the longer stamens, and the lower part of the ovarium is encircled by the cupular remains of the corolla, which here breaks away by a circumscissile line: this same process is described as existing in *L. Berlandieri*; but it partakes in no degree of the nature of a disk, as stated by M. Dunal†.

* This species with sectional details is represented in plate 68 C.
† A drawing of this plant with floral analysis is shown in plate 68 D.

34. *Lycium barbinodum* (n. sp.);—intricato-ramosum, subinerme, valde foliosum, ramis angulatis summe nodosis, cortice fusco, nodis majusculis, prominentibus, subglobosis, albido-cottoneis; foliis plurimis (6–8) fasciculatis, internodiis duplo longioribus, lineari-spathulatis, obtusis, imo in petiolum brevem deliquescentibus, glaberrimis, carnosulis; floribus parvulis in fasciculis solitariis, cum pedicello brevi folio dimidio curtioribus, calyce brevi, poculiformi, reticulato, fusco, brevissime 5-dentato, demum inæqualiter 2–3-fisso, dentibus sphacelato-pubescentibus; corollæ tubo imo coarctato, hinc repente campanulato, glabro, limbi laciniis 5, orbicularibus, margine subciliatis, tubo 4to brevioribus; staminibus 5, vix æqualibus, subexsertis, filamentis imo geniculatis in coarctationem tubi insertis, longiuscule hirsutis, superne glabris; stylo imo articulato, staminibus paullo longiore; ovario corollæ reliquo cupuliformi imo circumdato.—Mexico Septentrionali.—*v. s. in herb. Hook.* (Sierra Madre) *Seemann*, no. 2090.

A very leafy species, remarkable for its conspicuous, cottony, knotty axils, which are from $\frac{1}{4}$ to $\frac{1}{2}$ inch apart: the leaves, four to six in each fascicle, are 8 to 10 lines long, $1\frac{1}{2}$ to 2 lines broad: the flowers are about the size and shape of those of the preceding species; the peduncle, equal in length to the calyx, is 1 line long; the corolla is 3 lines long; the segments of the border are $\frac{3}{4}$ line long and broad*.

35. *Lycium glomeratum*, Sendtn. in Flor. Bras. fasc. 6. p. 154; Dunal in DC. Prodr. xiii. 512.

This very distinct species, fully described by Dr. Sendtner and M. Dunal, is remarkable for its approximated large leaves and copious fascicles of flowers. It is a small tree, growing commonly along the banks of the river San Francisco, about eighty miles from its mouth, where it is called Espinha, though it is generally unarmed. Its branches are much used by the natives for making fences. A variety, which may be called *obovatum*, on account of its more ovate and obtuse leaves, exists in Sir William Hooker's herbarium, collected by Mr. Gardner on the Ilha de San Pedro, an island near the mouth of the river San Francisco†.

*** *Filamenta paullo supra basin geniculatam globula pilorum donata.* Sp. 36 ad 38.

36. *Lycium nodosum* (n. sp.);—glaberrimum, inerme, ramis

* A representation of this species with explanatory sections is given in plate 68 E.

† This species is shown in plate 68 F.

flexuosis, cortice rimoso, albescente, ramulis virgatis, axillis approximatis, nodosis, cottoneis; foliis (2–5) fasciculatis, rarius solitariis et alternis, ovato- vel oblongo-spathulatis, apice rotundatis, imo in petiolum brevissimum attenuatis, eveniis; floribus in axillis solitariis, calyce cupuliformi, brevissimo, crassiusculo, æqualiter et acute 4-dentato; corollæ glabræ tubo infundibuliformi, limbi laciniis brevibus, latis, reflexis; staminibus 4, subæqualibus, longissime exsertis, filamentis in coarctationem tubi insertis, hinc geniculatis et barbatis, uno paullo breviori; stylo staminibus æquilongo; ovario disco carnoso adnato, et corollæ reliquo cupuliformi imo circumdato.—Provincia Tucuman Argentinorum.—*v. s. in herb. Hook.* (*Tweedie*).

The leaves are 5 to 7 lines long, $1\frac{1}{2}$ to $2\frac{1}{4}$ lines broad; the peduncle is 2 lines long; the calyx is $\frac{1}{2}$ line long; the length of the tube of the corolla is $2\frac{1}{4}$ lines, of the segments of its border $\frac{1}{2}$ line: the stamens are $1\frac{1}{2}$ line longer than the tube, and are inserted one-third of the distance from the base*.

37. *Lycium vimineum* (n. sp.);—inerme, ramulis virgatis, rectiusculis; foliis 2–3nisve (interdum 5nis) fasciculatis, linearibus, imo in petiolum brevem attenuatis, eveniis; floribus e fasciculis 2–3nisve parvulis, calyce 4-dentato pedunculo vix breviori, dentibus æqualibus acutis margine ciliatis tubo lævi, poculiformi paullo brevioribus; corollæ glabræ carnosulæ breviter et late cylindricæ tubo paullo supra basin breviter coarctato, hinc subcampanulato, limbi laciniis 4, late subdeltoideis, reticulato-venosis, tubo tertio brevioribus, reflexis: staminibus 4, æqualibus, exsertis, filamentis paullo supra basin insertis, hinc glabris et geniculatis, mox fasciculatim barbatis, maculis totidem pilosis intra tubum alternatim interjectis, stylo staminibus æquilongo.—Prov. Santa Fè Argentinorum.—*v. s. in herb. Hook.* (*Tweedie*).

This is said by Tweedie to be a shrub 12 to 20 feet high, evidently with long, slender, pendent branchlets, growing very plentifully near the town of Santa Fè, on the river Paraná: the branchlets are slender, of a light brown colour, smooth and striated. Two, three, or more leaves grow in a fascicle out of each cup-shaped axillary node; they are 10 to 16 lines long, 1 or 2 lines broad; two or three flowers spring out of each fascicle of leaves, one after another, at distant periods; the peduncle is $1\frac{1}{2}$ or 1 line long; the smooth cup-shaped calyx is of the same length, and is crowned by four equal triangular teeth with ciliated margins: the corolla is contracted near the base, is broadly campanular above, with four short and broad

* A drawing of this plant with sectional details is given in plate 69 A.

reflected segments, the length of the tube being $2\frac{1}{4}$ lines, and of the segments $\frac{3}{4}$ line: the stamens, inserted a little above the base of the tube, are 3 lines long; the style is $3\frac{1}{2}$ lines in length; the lower moiety of the ovary is enclosed in the cup-shaped induvial base of the corolla*.

38. *Lycium brevipes*, Benth. Voy. Sulphur, 40; DC. Prodr. xiii.; —spinosum, glaberrimum, ramulis striatulis, subflexuosis, nitidis, stramineis, apice spinosis; foliis solitariis, 2–3nisve, cuneato-oblongis subovatisve, obtusis; floribus parvis, brevissime pedunculatis, solitariis; calyce brevi, poculiformi, 5-dentato; corollæ tubulosæ tubo calyce 5plo longiori, limbi laciniis 5, brevibus, rotundatis, reflexis; staminibus insertis. —California.—*v. s. in herb. Hook.*—Magdalena Bay (*Barclay*), *specim. flore manco.*

A spiny shrub with a barren aspect, apparently with few obovate leaves, which are 4 to 9 lines long, narrowed at the base into a slender petiole, and 2 to 3 lines broad. The specimen above referred to has only a single imperfect flower, with a peduncle $\frac{1}{2}$ line long; the calyx measures 1 line, the corolla 3 lines, including the segments of its border $\frac{1}{2}$ line in length; more perfect flowers, according to Mr. Bentham, are 5 lines long†.

2. MESOCOPE. *Corolla infundibuliformis, limbi laciniis dimidium tubi superantibus, sed ejus longitudinem non excedentibus.*

A. GERONTOGEÆ.

* *Stamina lævia.* Sp. 39 ad 41.

39. *Lycium Barbarum*, Linn. ex parte, non aliorum; Dunal in DC. Prodr. xiii. 511, cum synonymiis variis ibi relatis.—In Persia Australi, Scinde et Afghanistan.—*v. s. in herb. Hook.* Abouschir (*Aucher Eloy*, n. 5037).—Dalechi, distr. Abouschir (*Kotschy*, n. 166).—Afghanistan (*Griffiths*, n. 670 et 672). —Scinde, Kurdigass (*Dr. Stocks*, n. 995).

This species was well distinguished by Linnæus, though confounded by other botanists and horticulturalists with *L. vulgare* and *L. Europæum*, from which it is marked by very peculiar characters. It is very spinose, with flexuose, knotty, crooked branches, its splitting bark being of a glaucous whitish or brownish hue; the nodes are large and very prominent, often woolly: the leaves, three to five in each axillary fascicle, are linear, obtuse, spathulate at base, diminishing into a short slender petiole; they

* This species with sectional details is represented in plate 69 B.
† This species with floral sections is represented in plate 69 C.

are 5 to 10 lines long and 1 to 1½ line broad; three to five flowers spring out of each fascicle; the peduncle is very slender, 5 lines long; the campanular and somewhat scarious calyx is very thin in texture, of a pale glaucous hue, is 1½ line broad and long, at first with five short minute teeth, but they become irregularly cleft into one, two, or three longer fissures: the corolla is thin in texture, funnel-shaped, the tube, contracted a little above the base, being 3 lines long, and the five equal, smooth, oblong segments of its border being 2 lines in length: the stamens inserted below the middle of the tube are quite smooth, one being shorter, reaching the mouth, while the other four are a little longer and somewhat exserted; the immature berries are slightly obovate, apiculated at the summit, and barely 2 lines in diameter. No. 670, from Afghanistan, has a much paler and smoother bark. The specimen from Kurdigass appears to have grown luxuriantly in a moist situation, for the leaves are much larger, and frequently solitary in each axil, being 1½ inch long, and 3 to 5 lines broad*.

40. *Lycium Turcomanicum*, Turczan. MSS. *sp. adhuc indescripta*; —ramis virgatis, ramulis apice in spinis abeuntibus, axillis sæpe nodosis et ramulis spinescentibus aphyllis; foliis solitariis 2–3nisve, oblongis vel lanceolato-oblongis, glaberrimis, eveniis, imo cuneatis: floribus parvis, solitariis, interdum binis ternisve, brevissime pedunculatis, calyce late cupuliforme inæqualiter 5-dentato, dentibus acutis, sparse ciliatis, corollæ tubo striato imo valde contracto, superne late infundibuliformi, glabro, limbi laciniis 5, ovatis, tubo tertio brevioribus, margine subciliatis, staminibus 5, inæqualibus, exsertis, filamentis omnino glabris, medio tubi insertis, 3 paullo longioribus, laciniis limbi æquantibus.—Turcomania.—*v. s. in herb. Hook.* (*Turczaninow*).

A plant bearing greatly the aspect of the specimens of *L. Barbarum*, from Scinde and Afghanistan; differing in its more angular branches, the shorter peduncles of its flowers, and the proportions of its floral parts. The larger leaves measure 1½ inch in length, 5 lines in breadth; the peduncle is 1½ line long, the calyx 1 line long and broad, the tube of the corolla 2½ lines long, and the segments of its border 1 line in length†.

41. *Lycium Edgeworthii*, Dun. in DC. Prodr. xiii. 525;—intricatissimo-ramosum, spinosum, cortice cretaceo rimoso: cæt. ut in char. citat. except. in sequentibus; corolla extus glabra, sed intus circa insertionem staminum sæpe pilosiuscula, fila-

* Sectional details of this species are shown in plate 69 D.

† This plant with an analysis of its flower is represented in plate 69 E.

mentis omnino glabris, circa medium tubi insertis, 2 minoribus faucem attingentibus, 3 longioribus exsertis.—Beloochistan.—*v. s. in herb. Hook.* (in montibus sursum Kelât, versus Johan.) *Dr. Stocks*, n. 1117.

This species is probably widely distributed through Scinde, Cabul, and Upper India: the habit of Dr. Stocks' plant is different from the specimen from the Punjaub, collected by Mr. Edgeworth, according to the description above quoted of M. Dunal: the former is very thorny, of bare and stunted growth, with twisted and interlaced branches and small leaves, and has evidently grown in an exposed and arid situation; while the latter has long, slender, virgate branches, and abundant foliage of much larger leaves, and was apparently produced in a damp and sheltered place, favourable to its more luxuriant growth. Dr. Stocks' specimens present more the aspect of *L. Barbarum*, but are distinguished by their much shorter peduncles, more fleshy leaves, and a generally more tartareous appearance; the very flexuose divaricating branches are covered with a splitting bark of a cretaceous hue, with fascicles of few leaves (three to six) proceeding out of the knotty base of the axillary spines: the leaves are linear, obtuse at the summit, tapering below into a short petiole; they are remarkably thick and fleshy, of a pale glaucous hue, 4 to 9 lines long and $\frac{1}{2}$ line broad: one to five flowers grow out of each fascicle; the peduncle is 2 lines long; the pale glaucous, tubular calyx, often unequally cleft, is $1\frac{1}{2}$ line long: the tube of the corolla, greatly contracted in its lower moiety and funnel-shaped above, is 3 lines long, the oblong segments of its border being 2 lines in length; it is quite smooth, excepting a little appearance of pubescence about the insertion of the stamens, which are unequal in length, the filaments being quite smooth, one not extending beyond the mouth of the tube, two of the length of the segments, and the other intermediate; the style is the length of the longer stamens. It will be seen how little this structure differs from *L. Barbarum*, and it might be almost considered as a mere variety of that species, from which it is easily distinguishable by the characters above enumerated*.

** *Staminibus imo hirsutis.*

42. *Lycium Ruthenicum*, Murray, Comm. Gött. 1779, p. 2. tab. 2; Willd. Sp. i. 1058; Dunal in DC. Prodr. xiii. 514, cum aliis synon. (excl. *L. Tataricum*).—In Siberia et Russia Australi.—*v. s. in herb. Hook.* (Mare Caspico) *ex herb. Acad.*

* This plant with its floral analysis is drawn in plate 69 F.

Petropol.—(Iberia orientali) *W. Busen;—et in herb. Lindley, Hort. Chisw. cult. sub nom. L. carnosum.*

A plant completely with the habit of *L. Barbarum*, but differing in the structure of its flowers. The stems are smooth, very pale, flexuose, with spinose spreading branchlets; the axils are nodose; the leaves, two to four in each axillary fascicle, 8 to 15 lines long and 1 to $2\frac{1}{2}$ lines broad, are quite smooth and fleshy: several flowers spring out of each fascicle; the peduncles are 2-$2\frac{1}{2}$ lines long, the calyx 1 line, the tube of the corolla 3 lines, the segments of the border 2 lines; the filaments are inserted about the middle of the tube, and are hirsute towards the base, smooth above, reaching the extremities of the border-segments*.

*** *Staminibus imo fascicula pilorum barbatis.* Sp. 43 ad 47.

43. *Lycium vulgare*, Dunal in DC. Prodr. xiii. 509, cum omn. synon. ibi citat. Lycium Chinense, *Miller, Dunal in DC. ibidem*, 510, *cum suis respectivis synon.* Lycium megistocarpum, *Dunal, ibid. cum synon.* Lycium subglobosum, *Dunal, ibid.* Lycium Cochinchinense, *Lour.*; *Dunal ut supra citat*;—fruticosum, erectum, glabrum, inerme, vel sæpe sparse spinosum, ramulis angulatis, virgatis, arcuato-nutantibus; foliis subalternis, rarius fasciculatis, ovatis, vel ellipticis, apice subacutis, vel obtusis, imo cuneatis, vel in petiolum tenuem spathulatis, junioribus lanceolatis: floribus ex axillis solitariis, aut 2 ad 6, pedicello filiformi, flore longiori, calyce tubulari, breviter 5-dentato, sæpe in laciniis 2–3 rupto, glabro, textura tenui, dentibus margine subciliatis, corollæ tubo imo coarctato, mox infundibuliformi, limbi laciniis oblongis, striato-reticulatis, violaceis, expansis, tubo fere æquilongis; staminibus 5, fere æqualibus, exsertis, filamentis in tubi constrictionem insertis, hinc geniculatis et glabris, mox fascicula densa pilorum barbatis, superne glabris et filiformibus, apice laciniarum attingentibus: bacca rubro-aurantiaca, ovata, vel conico-oblonga, sæpe incurva, calyce fisso suffulta.—Ubique in Europa australi, Africa et Asia, præsertim in China.—*v. s. in herb. variis, specim. plurimis ex Europa. In herb. Hook.*, China (*Fortune*, 48 et 57). Loo-choo (*Beechey*).

On comparing original specimens from China with those of European growth and those of Western Asia, I cannot detect the smallest essential difference between them; and on examining carefully all the details registered concerning the various species

* This species is shown in plate 70 A.

above comprehended in this one, I cannot discover any character that can possibly separate them, except such small variations in the shape of the leaves as we frequently meet with in the same specimen: in the length and number of the peduncles, the form of the calyx, the structure of the corolla, and especially of the stamens, and in the size, shape, and colour of the fruit, they closely resemble one another: under such circumstances it appears to me desirable to unite them all under one common specific character. The observation of M. Dunal almost confirms this, for he states that this species has in all likelihood been introduced into Europe from the East, which is rendered more probable from the record of its being used from the earliest periods by the Persians, Greeks, and Romans for ornamental hedgings. In favourable positions the leaves often attain a size of $2\frac{1}{2}$ inches in length, including the petiole, and $1\frac{1}{4}$ inch in breadth; the peduncles are 4 to 6 lines long, the calyx 2 lines, the tube of the corolla 3 lines, the segments of the border $2\frac{1}{2}$ lines, and the stamens extending beyond the mouth of the tube $2\frac{1}{2}$ lines; the berry is from 5 to 8 lines long and 4 lines broad. Intermediate with the globular fascicles upon the stamens, an equal number of tufts of hair are seen on the tube of the corolla, upon the central nervure that runs from the apex of each segment to the base: an excellent analysis of the flower is given in Nees' Flor. Germ. Several varieties, cultivated by gardeners under the names of *L. ovatum, Trewianum, carnosum, latifolium,* &c., may be referred here*.

44. *Lycium Kraussii,* Dun. in DC. Prodr. xiii. 517.—C.B.S.

Of this species I am unable to form an opinion, not having met with any specimen that corresponds with the description given, as above cited: M. Dunal appears to doubt its being a valid species, and asks whether it may be only a variety of *L. cinereum,* Thunb.

45. *Lycium rigidum,* Thunb. Prodr. 37; Linn. Trans. ix. 152, tab. 14; Dunal in DC. Prodr. xiii. 522.—C.B.S.

I have not met with any specimen that corresponds with this plant of Thunberg, although M. Dunal describes a specimen from the collection of M. Drège: I infer from that description that it must belong to this section. It is evident however that many Cape plants that have been referred to this species do not belong to it: for instance, the variety γ. *angustifolium* of M. Dunal (*loc. cit.* p. 523), from Drège's collection, *sub nom. L. rigidum,* and which I find also under this name in Sir. W. Hooker's herbarium,

* This species with sectional details is given in plate 70 B.

is manifestly a specimen of *L. Afrum*: so also from the same collection a plant distributed under the name of *L. campanulatum*, E. Mey., and referred by M. Dunal to *L. rigidum*, var. *β. latifolium-grandiflorum*, from the specimen in Sir W. Hooker's herbarium, is also *L. Afrum*: it is not unfair to conclude that the other variety, *α. latifolium-parviflorum*, belongs to some other species.

46. *Lycium Requieni*, Dunal in DC. Prodr. xiii. 520.—Patria ignota.

This plant, cultivated in the Botanic Garden of Montpelier under the name of *L. carnosum*, is probably of African origin. From M. Dunal's description I have placed it in this section.

47. *Lycium prunus spinosi*, Dunal in DC. Prodr. xiii. 515.—C.B.S. (*Drège*, n. 7871).

I have not seen a specimen of this species, but from M. Dunal's account of it I have stationed it here.

**** *Filamenta basi glandula lineari fimbriata donata.*
Sp. 48 ad 49.

48. *Lycium Tataricum*, Pallas, Flor. Russ. i. 78. tab. 49. L. Ruthenicum, *Dunal* (*non Murr.*) *in Prodr. DC.* xiii. 514;—fruticosum, glaberrimum, intricato-spinosum, ramulis pallidis, flexuosis, nodis spinescentibus, approximatis; foliis plurimis (6-8) fasciculatis, linearibus, spathulatis, obtusis, carnosulis; floribus e fasciculis solitariis, rarius geminis, calyce pedunculo breviori, poculiformi, subscarioso, inæqualiter 3–4-fisso, laciniis rotundatis, corolla imo coarctata, superne infundibuliforme, limbi laciniis oblongis, tubo 2–3tio brevioribus, staminibus exsertis, filamentis imo in glandulam linearem margine ciliatam expansis.—Rossica australis.—*v. s. in herb. Hook. ex herb. Pallas.*

This is certainly very distinct in the structure of its flowers from *L. Ruthenicum*: the nodes are about $\frac{1}{4}$ inch apart, the spines of the same length, the leaves 3 to 5 lines long, and barely a line broad: the pedicels are 3 lines, the calyx $1\frac{1}{2}$ line, the tube of the corolla 3 lines, the segments of the border 2 lines long; the stamens, inserted in the lower portion of the tube, have a long basal expansion which is ciliated on the margin; the stamens are equal, and nearly attain the length of the segments*.

49. *Lycium ferocissimum* (n. sp.);—fruticosum, ramosissimum, glaberrimum, ramis griseo-pruinosis, ramulis horizontaliter

* A representation of this plant with floral sections is shown in plate 70 C.

divaricatis, validis, apice spinosis, spinis giganteis efformantibus, axillis globoso-nodosis; foliis e nodis fasciculatis, obovato- vel oblongo-spathulatis, obtusis, carnosulis; floribus e fasciculis solitariis vel binis, longe pedunculatis, calyce tubuloso, majusculo, carnoso, breviter 5-dentato, dentibus margine ciliatis, imo longiusculo, corollæ tubo infundibuliformi, imo angustato, calyce vix longiori, limbi laciniis 5, oblongis, reticulato-venosis, tubo fere æqualibus; staminibus in constrictionem tubi insertis, filamentis imo geniculatis et in glandulam linearem margine densissime tomentosam expansis, superne glabris, inæqualibus, 2 versus apicem, 3 ad medium limbi attingentibus; stylo staminibus majoribus æquante: bacca pisi magnitudine, calyce fisso suffulta.—C.B.S.—*v. s. in herb. Hook.* Uitenhag (*Harvey*, n. 105).

This is a species evidently allied to *L. rigidum*, Thunb., differing in its thick gigantic spines, its broader leaves, its much bigger calyx and larger flowers. The spines are from 2 to $2\frac{1}{2}$ inches long; the leaves are 6–10 lines long, $2\frac{1}{2}$–4 lines broad; the peduncle 4 lines long, the calyx 3 lines long and $2\frac{1}{2}$ lines in diameter; the tube of the corolla is a trifle longer than the calyx, and the segments of the border about the same length; the berry is globular, 3 lines in diameter*.

B. Neogeæ.

* *Stamina lævia.*

50. *Lycium capillare* (n. sp.);—fruticulosum, inerme, ramulis virgatis, valde gracilibus, horizontaliter divaricatis, albo-pubescentibus, lineis helvolis e nodis utrinque decurrentibus angulato-striatis: foliis fasciculatis (5–8), e nodis cupularibus capillari-linearibus, minutissime pubescentibus, carnosulis; floribus solitariis, parvulis, pedunculo gracili, calyceque parvo, poculiformi, 5-striato, 5-dentato, subpubescente, dentibus glabris, acutis: corolla tubulosa, glabra, tubo profunde 5-sulcato, limbi laciniis 5 oblongis, margine ciliolatis tubo paullo brevioribus: staminibus æqualibus, exsertis, filamentis medio tubi insertis, glabris, ad medium limbi attingentibus: bacca pisi minoris magnitudine, rubra, calyce fisso suffulta.—In prov. Mendozæ Argentinorum, in desertis salitrosis.—*v. v.*

I found this plant in the Travesia of Mendoza, a desert plain near the foot of the Andes, and at La Dormida, in the same province. It is a very distinct species, not only on account of its extremely capillary leaves, but of its perfectly glabrous stamens. The leaves are about 4 lines long and $\frac{1}{8}$th of a line broad

* This species with analytical details is given in plate 70 D.

the capillary peduncle is 2 lines long, the calyx $\frac{3}{4}$ line, with teeth one-third of its whole length; the tube of the corolla is rather broad, is deeply sulcated opposite the stamens, and is 3 lines long, the lobes of the border being 2 lines in length; the thick, fleshy, smooth filaments are $2\frac{1}{4}$ lines long; the berry is somewhat ovate and apiculate, 2 lines long*.

** *Stamina imo hirsuta.* Sp. 50 ad 54.

51. *Lycium floribundum*, Dun. in DC. Prodr. xiii. 513.—In prov. Mendozæ (ad Jarillal circa Mendozam) et in prov. Sanctæ Ludovicæ Argentinorum (ad Alto del Yeso) (*mihi lectum*); circa Mendozam (*Bacle in herb. Moricand*); Chile, *in herb. Lindley*; ad Coquimbo (*MacRae*).

The name of *floribundum* is ill applied to this very distinct species, for it is generally very sparse of flowers, although Bacle's specimen, like that collected by me at the Alto del Yeso, may have presented more flowers than usual. It is of very straggling growth, the tortuous branches spreading out at right angles: the spines are generally $\frac{3}{4}$ inch long, and slightly bent and recurved; they are all covered with a whitish pubescent bark, marked by reddish longitudinal lines, decurrent from the angles of each cup-shaped node: the spines have many gemmiferous axils; the leaves are fasciculate in each closely approximate node, are spathulately ovate, fleshy, covered with short, simple, and glandular hairs, mixed together, and proceeding out of as many whitish rugous spots; they are 2–$2\frac{1}{2}$ lines long, $\frac{3}{4}$–1 line broad; the flowers are solitary in each fascicle, $\frac{1}{2}$ line long; the calyx is pubescent, tubular, 2 lines long, half-cleft into five rather equal, lanceolate acute teeth, which are somewhat recurved at their apex: the tube of the corolla is cylindrical, and slightly funnel-shaped above, but constricted a little above the base, is $2\frac{1}{2}$ to 3 lines long, and is covered with short glandular hairs; the segments of the border are oblong, and $1\frac{1}{4}$ line long: the stamens are inserted about the middle of the tube; the filaments are hirsute at base, smooth above; the two shortest reach the middle, the three longer attain the extremity of the segments: the style is even longer: the corolla, as in other species of this genus, breaks off by a circumscissile line above its base, leaving the ovary half surrounded by a cup-shaped process. In the specimen from El Alto del Yeso, the spines are fertile to the extremity, the leafy fascicles being only 1 line apart: the berry is globular, apiculated, $1\frac{1}{2}$ line diameter. The specimen from Coquimbo agrees in all respects with the others, except that the

* This species with sectional details is drawn in plate 70 E.

ramifications are more intricately branched and spinose; the bark is darker, more striated and pubescent, and the leaves are smaller; the axillary nodes, however, are equally approximate, and the flowers are exactly similar in size and structure*.

52. *Lycium rachidocladum*, Dun. in DC. Prodr. xiii. 519;—intricato-ramosum, spinosum, ramulis rufescente-roridis, glandulis glutinoso-resinosis et pilis articulatis vestitis, spinis junioribus acutis, gemmiferis, adultioribus tortuoso-ramiformibus: foliis parvis, obovatis, carnosis, apice rotundis, imo in petiolum tenuem spathulatis, utrinque viscoso-puberulis, pilis crebris, brevissimis, crassiusculis, glanduliformibus; floribus subsolitariis, breviter pedunculatis, calyce inæqualiter 4- rarius 5-fido, segmentis acutis, subreflexis, utrinque glanduloso-pubescentibus; corollæ tubo extus glandulis brevibus farinoso-puberulis, calyce 2plo longiore, infundibuliforme, limbi laciniis 5, oblongis, margine ciliatis, tubo brevioribus: staminibus 5 inæqualibus, 3 longioribus laciniis æquilongis exsertis, filamentis tenuibus, medio tubi insertis, imo geniculatis et longe hirsutis, superne glabris: stylo exserto, cum ovario articulato; ovario corollæ reliquo semi-vestito.—Chile.—*v. s. in herb. Lindley* (Coquimbo) ***MacRae.***

This species differs little from *L. floribundum*, Dun., but its branches are more intricately spreading and spinose, the bark is darker and more farinose, the leaves are smaller and more oblong; on the other hand, their axillary nodes are equally approximated, and there is no difference in the size or structure of the flower. The leaves are $1\frac{1}{2}$ to 2 lines long, $\frac{3}{4}$ line broad; the barren spines are 2 to 3 lines, the gemmiferous 4 to 6 lines or longer; the peduncle $\frac{3}{4}$ line; the calyx $1\frac{1}{2}$ line long, cleft nearly halfway into five very acute teeth; the tube of the corolla is 2 lines, and its segments $1\frac{1}{2}$ line long; it is glabrous, except near the point of insertion of the stamens: the filaments are pilose at their base for a quarter of their length, three of them reach the extremity of the segments, two are shorter; the slender style is the length of the longer stamens, and is articulated with the ovarium†.

53. *Lycium tenuispinosum* (n. sp.);—fruticosum, intricato-ramosum, ramulis helvolis, viscoso-puberulis, valde divaricatis, tenuiter et crebre spinosissimis: foliis minutis, fasciculatis, anguste linearibus, viscoso-puberulis; floribus e fasciculis solitariis, calyce tubuloso, pilis articulatis crebre pubescente, ultra

* A drawing of this plant with floral sections is given in plate 70 F.
† This species with analytical details is shown in plate 71 A.

medium 5-fido, segmentis lanceolatis, subreflexis, pedunculo gracili æquilongo; corolla tubulosa, tubo calyce æquante, parte infimo cylindrico, attenuato, pilosulo, superiori inflato, glabro, limbi laciniis tubo brevioribus, oblongis, staminibus exsertis, filamentis supra medium insertis, hinc geniculatis et hirsutis, 2 ultra faucem prolatis, 3 fere ad apicem laciniarum extensis.—Circa Mendozam in aridis petrosis.—*v. v.*

This species, which I found near Mendoza, in the desert tract called La Travesia, in many points resembles *L. floribundum* and *rachidocladum*, but is widely distinct. It is remarkable for its almost denuded, slender, spreading branchlets, armed with short, closely-set, needle-like spines; they are generally 2 or 3 lines long and 1 or 2 lines apart, furnished at their base with a fascicle of four to six minute linear subulate leaves, barely $\frac{3}{4}$ line long; a few of the fascicles bear a single flower, the peduncle of which is $1\frac{1}{2}$ line long; the calyx is $2\frac{1}{2}$ lines long; the tube of the corolla measures $2\frac{1}{2}$ lines, and the segments of the border $1\frac{1}{4}$ line in length; the stamens are inserted above the middle of the tube, where it is pubescent, they are considerably hirsute at their lower part, and smooth above; the hairs that clothe the pedicel and calyx are dense and articulated; the style exceeds the length of the stamens*.

54. *Lycium stolidum* (n. sp.);—fruticosum, glaberrimum, ramis flexuosis, ramulis intricato-divaricatis, spinescentibus, cortice rimoso, striato, griseo, nodis approximatis, spinis brevibus imo foliosis; foliis (2–5) fasciculatis, spathulato-linearibus, obtusis, carnosulis, pallidis; floribus e fasciculis binis, parvulis, pedunculo tenui, calyce parvo æqualiter ac breviter 4-dentato, corolla lævi, pallida, textura tenui, tubo imo coarctato, superne subcampanulato, limbi laciniis 4, tubo vix dimidio longitudine, oblongis, acutiusculis, reflexis; staminibus 4, æqualibus, longe exsertis, filamentis in contractionem basalem insertis, hinc geniculatis et hirsutis, superne glabris, apice limbi attingentibus, stylo æquilongis, tubo circa insertionem filamentorum piloso; bacca globosa, piso minori, apiculata, calyce suffulta.—Texas.—*v. s. in herb. Hook.* Paso del Norte (*Wright*, no. 540, 542).

A plant not unlike *L. Barbarum* in habit. Owing to the close approximation of the nodes, which are only $\frac{1}{4}$ inch apart, the leaves are somewhat crowded; they are 5 to 7 lines long, 1 line broad; the slender peduncle measures $2\frac{1}{2}$ lines, and the narrow calyx 1 line; the tube of the corolla is $2\frac{1}{2}$ lines long, and the

* A representation of this plant, with analysis of its flowers, is given in plate 71 B.

reflexed broad segments of the border are 1 line in length; it is thin in texture and pale when dried; the filaments are inserted above the basal contraction of the tube, are hirsute below, slender and smooth above, and attain the length of the segments of the border: the berries are small, apparently red, 2 lines in diameter, and contain eight seeds, which are flattened; these have a helically spiral embryo*.

*** *Filamenta paullo supra basin fasciculo pilorum donata.*
Sp. 55 ad 58.

55. *Lycium spinulosum* (n. sp.);—virgato-ramosum, ramulis helvolis, striatis, pilosis, patentibus, tenuiter spinosis, inferioribus subnudis, superioribus foliiferis, axillis nodosis approximatis, spinis acicularibus, gemmiferis; foliis fasciculatis (2–5) oblongis, apice acutis, basi in petiolum brevissimum cuneatis, valde crassis, utrinque pilosis, pilis brevibus articulatis, nonnullis apice glandulosis; floribus solitariis, pedunculo brevi, calyce majusculo, glanduloso-piloso, pedunculo 3plo longiore, tubuloso, ultra medium 5-fido, segmentis rigidis, lanceolatis, acutissimis; corolla glabra, tubo infundibuliformi calyce æquilongo, limbi laciniis fere dimidio brevioribus, oblongis; staminibus 5, longe exsertis, filamentis medio tubi insertis, hinc geniculatis et glabris, mox infra faucem fasciculo pilorum barbatis, et ore claudentibus, 2 longioribus apice limbi attingentibus, 3 paullulo brevioribus.—Circa Mendozam.—*v. v.*†

This plant, gathered by me in the Travesia of Mendoza, in the year 1826, is certainly a distinct species: it bears greatly the habit of *L. tenuispinosum*, but its branches are straighter, the spines stronger, the leaves larger, the calyx of much greater size and more rigid in its texture, and the stamens are of different structure. It is at once distinguished by its peculiar calyx. The spines measure 2 lines, the leaves, including the petioles, are 3 lines long and 1 line broad; the peduncle is 1 line; the calyx 3 lines in length, the tubular portion being only $\frac{3}{4}$ line; the tube of the corolla measures 3 lines, the segments of the border 2 lines.

Var. β. *parvifolium*, Gill. MSS., is a more intricately nodose plant, becoming with age more glabrous; the leaves are more linear, smaller, $2\frac{1}{2}$ to 3 lines long, $\frac{1}{4}$ line broad: the flowers do not differ from the former in size or structure; it was found by Dr. Gillies in the Travesia, and is preserved in Sir Wm. Hooker's herbarium.

* This species with floral sections is drawn in plate 71 C. A
† A representation of this plant with analysis is given in plate 71 D.

56. *Lycium infaustum* (n. sp.) ;—intricato-ramosum, spinosum, glaberrimum, ramulis pallidis, angulato-costatis ; foliis paucis, minutis, alternis vel fasciculatis, obovatis, vel spathulato-oblongis, carnosulis, pallidis ; floribus solitariis, glabris, longe et gracile pedunculatis, calyce parvulo, urceolato, crasso, breviter 5-dentato, dentibus triangularibus, acutis ; corolla infundibuliformi, limbi laciniis ovatis, tubo brevioribus, staminibus 5 æqualibus, longe exsertis, filamentis medio tubi insertis, imo glabris et geniculatis, mox fasciculo pilorum barbatis et faucem claudentibus, superne filiformibus, glabris, apice limbi paullo excedentibus, tubo globulis 5 pilorum inter fasciculos staminum alternantibus ; bacca globosa, coccinea, piso minori. —In Prov. Argentinorum Australioribus.—*v. s. in herb. Hook.* (*Tweedie.*)

This plant was found by Tweedie in the southern portion of the province of Buenos Ayres, always called by him Patagonia. It is remarkable for its small ericoid leaves, which are $1\frac{1}{2}$ to $2\frac{1}{2}$ lines long and 1 to 2 lines broad : the peduncle measures 2 lines, the calyx 1 line, the tube of the corolla 3 lines, the segments of its border 2 lines, all being quite smooth except the five barbate tufts that alternate with the hairy pellets of the stamens*.

57. *Lycium Martii,* Sendtn. Flor. Bras. fasc. 6. Sol. 154; Dunal in DC. Prodr. xiii. 512.—Brasilia (in Prov. Bahia) ad fluv. S. Francisco prope Joazeiro.

58. *Lycium Carolinianum,* Mich. Fl. Bor. Amer. i. 95; Walt. Fl. Carol. 84 ; Pursh, Fl. Amer. Sept. i. 97; Dunal in DC. Prodr. xiii. 513. L. salsum, *Bartr. Trav.* 59. *nec R. & P.* L. quadrifidum, *Moç. et Sessè, Ic. Mex. Coll. Cand.* t. 914. Panzera Caroliniana, *Gmel. Syst.* i. 247 ;—fruticosum, inerme, glaberrimum, ramulis rectis, striatis, rarius spinosis ; foliis alternis, rarius fasciculatis, spathulato-lanceolatis vel linearibus, acutis aut obtusiusculis, crassis, eveniis ; floribus solitariis, folio brevioribus, tetrameris, pedunculo elongato, calyce campanulato, grosse 4-dentato, corolla cærulescente, tubo infundibuliformi, imo crassiore, supra basin constricto, limbi laciniis tubo brevioribus, staminibus 4 subæqualibus, exsertis, filamentis longe subtus medium tubi insertis, imo geniculatis et fascicula oblonga pilorum dense barbatis : bacca cerasi parvi magnitudine, rubra.—America Septentrionali.—*v. s. in herb. Hook.* (Galveston Bay, Tenessee) *Drummond.* (Rio Brazos, Texas) *Drummond.* (New Orleans) *Drummond,* n. 234. (circa Laredo) *Berlandier* (n. 1502 et 242). *In herb. Lindley* (Texas) *Drummond.*

* This plant with floral details is shown in plate 71 E.

This well-known species, long since established upon very distinct characters, appears to differ in no essential respect from the plant described by Moçino and Sessè, and which may safely be considered as identical with it, especially as I find the description of its fruit corresponds with the specimen above noticed from New Orleans. The leaves are generally single and alternate, from 7 to 18 lines long and $1\frac{1}{2}$ to $2\frac{1}{2}$ lines broad, narrowing at the base into a short channelled petiole: the peduncle is slender below, thicker at its apex, and is from 5 to 8 lines long; the cup-shaped calyx is nearly 2 lines in length, with four short triangular teeth, ciliated at their points, but it is afterwards split irregularly into larger segments: the tube of the corolla is 3 lines long, the oblong segments of its border $2\frac{1}{2}$ lines; the filaments arise in the mouth of the basal constriction of the tube, and present a dense oblong brush of hairs at their geniculated origin, their summits attaining the length of the middle of the segments, two of them being a trifle shorter; the style far exceeds the length of the stamens: the crimson globular or oval berry is somewhat apiculated, and 5 lines in diameter*.

******** *Filamenta imo glandula lineari carnosa margine ciliata donata.* Sp. unica.

59. *Lycium ignarum* (n. sp.);—fruticosum, ramulis longe virgatis, dependentibus, angulato-striatis, pallidis, rarissime spinescentibus, nodis axillaribus cupulatis; foliis alternis ternisve, elliptico-oblongis, utrinque subattenuatis, subpallidis, textura tenuibus, nervosis, utrinque sub lente albo-punctulatis, margine obsolete ciliatis, breviter petiolatis; floribus solitariis, longe et gracilente pedunculatis, calyce urceolato, striato, membranaceo, pubescente, æqualiter 5-dentato, dentibus lanceolatis, acutis, tubo dimidio brevioribus; corolla extus pubescente, imo densiter tomentosa, sicco pallida, tubo infundibuliformi, calyce duplo longiore, limbi laciniis 5, reticulato-nervosis, staminibus 5 æqualibus, exsertis, filamentis circa basin tubi insertis, hinc geniculatis et glandula adnata oblonga latiuscula margine ciliata donatis, superne membranaceis, gradatim angustioribus, vix apicem laciniarum attingentibus; stylo staminibus æquilongo; stigmate sub-2-labiato.—Patria ignota: an America meridionali?—*v. s. in herb. Lindley* in hort. Soc. Hortic. cult. sub nomine *L. Sinense*.

This plant has much of the habit of *L. erosum*, and from many peculiar points of analogy, I have little doubt is of South Ame-

* A representation of this species with structural details is given in plate 71 F.

rican origin. The leaves are 19 lines long and 7 lines broad, the peduncle of the flower $4\frac{1}{2}$ lines, the calyx 2 lines, the teeth being equal in length to the tube, the corolla 6 lines, the tube being 3 lines long, and the segments of the border the same length*.

3. MACROCOPE. *Corollæ tubus laciniis limbi brevior : stamina longe exserta.* Species omnes *Neogeæ.*

* *Filamenta imo glandula lineari carnosa margine ciliata donata.*

60. *Lycium filifolium,* Gill.;—inerme, glaberrimum, ramosissimum, ramulis virgatis, cinereis, striatis, nodis cupulatis; foliis alternis, vel subfasciculatis, longe et anguste linearibus, utrinque acutis, crassiusculis; floribus solitariis, gracile pedunculatis, calyce poculiformi, subpubescente, membranaceo, 5–6-costato, 5–6-dentato, dentibus obtusiusculis, ciliatis; corollæ tubo calyce 3-plo longiore, infra medium coarctato, cylindrico, imo incrassato annulo barbato cincto, fauce ampliato, limbi laciniis 5–6, oblongis, tubo sub-brevioribus, margine ciliatis, staminibus 5–6, in coarctationem insertis, filamentis imo geniculatis, glandula elongata margine dense barbata donatis, superne lævibus, subæqualibus, exsertis; stylo staminibus excedente.—Prov. "Buenos Ayres" Argentinorum. —*v. s. in Herb. Hooker.* (Bahia Blanca) *Darwin,* no. 509. (Pampas, ad Monte de Loro) *Gillies.*

This is evidently a shrub with long slender branches, much resembling *L. vimineum* in habit, but distinguished by a different floral structure: the leaves are 4 to 9 lines long; in Dr. Gillies' specimen they are not more than $\frac{1}{4}$ line broad, in Mr. Darwin's they are $\frac{1}{4}$ to $\frac{3}{4}$ line broad: the very slender pedicels are $1\frac{1}{2}$ line long; the calyx is narrow, somewhat pubescent, and 1 line in length; the tube of the corolla is $1\frac{1}{2}$ line, the border 1 line long; the stamens reach the length of the segments of the border †.

Var. β. *minutifolium*;—ramulis multo gracilioribus, foliis brevioribus, fasciculatis aut alternis, glaberrimis; calycis dentibus ciliatis; corolla pentamera; bacca parvula, globosa, coccinea, calyce immutato suffulta.—Patagonia (*Tweedie*).

The branchlets here are almost filiform, the leaves 2 to $2\frac{1}{2}$ lines long, $\frac{1}{4}$ line broad, the peduncle is $1\frac{1}{2}$ line, the calyx of similar length, the corolla 3 lines long, and the berry 2 lines in diameter.

* This plant with analytical sections of the flower is shown in plate 72 A.
† This species with floral analysis is shown in plate 72 B.

61. *Lycium salsum*, R. & P. Fl. Per. ii. 46. tab. 183 *a*; Dunal in DC. Prodr. xiii. 519. L. gracile, *Meyen*? *Nov. Act. Ac. Cæs. Leop.* xix. *Sup.* i. 389;—biorgyale, subscandens, omnino glaberrimum, ramulis gracillime virgatis, angulato-costatis, spinis acicularibus sæpe munitis: foliis subfasciculatis, spathulato-linearibus, glaberrimis: floribus solitariis pendulis, pedunculo capillari folio longiore, calyce parvo, poculiformi, 5-costato, inæqualiter 5-dentato, dentibus apice ciliatis; corollæ albo-purpureæ tubo brevi calyce longiore, extus glabro, infra medium coarctato, fauce ampliato, limbi laciniis tubo sublongioribus, oblongis, margine ciliatis; staminibus 5 æqualibus, longe exsertis, filamentis in coarctationem tubi sistentibus, circa basin geniculatam fascicula densa oblonga pilorum donatis, istis cum fasciculis totidem tubo adnatis alternantibus.—In Peruviæ litoribus.—*v. s. in herb. Hook.* Lurin et Pachacamac (*Mathews*, no. 450).

This is a trailing shrub with long slender pendulous branches, growing in saline places near the sea, and having much the habit of *L. pendulinum*. The leaves have a saline taste, whence its specific name; they are about 4 lines long, 1 line broad, and veinless; the peduncle is slender, filiform, $2\frac{1}{2}$ to 3 lines long; the tubular calyx is 1 line long, smooth, with five unequal, short, pubescent teeth; the tube of the corolla is $1\frac{3}{4}$ line in length, the segments of the border are somewhat longer, narrow, oblong and subciliated on the margins: the filaments are inserted at a quarter the length of the tube from the bottom, and a little above their smooth geniculated base are furnished with a dense oblong brush of hairs; they reach the extremity of the segments of the border, and are therefore much exserted when the flower is expanded *.

62. *Lycium Chilense*, Miers, Trav. ii. 531; Bertero, Mem. Tur. xxxiii. 133. tab. 44; Dunal in DC. Prodr. xiii. 514. L. nutans, *Pöp.* L. canum, *Gill. MSS. Walp. Rep.* iii. 112;—subinerme, rarissime spinescens, ramulis inermibus pubescentibus, angulato-costatis, lineis helvolis e nodis cupularibus utrinque decurrentibus, foliis alternis, raro subfasciculatis, ovatis vel oblongis, sæpe angustis, subacutis, aut interdum obtusiusculis, imo in petiolum brevissimum attenuatis, integris, utrinque breviter pubescentibus, pilis brachiato-articulatis; floribus solitariis, pedunculo piloso, calyce ad medium æqualiter 5-fido, utrinque glauco-piloso, dentibus acutis, ciliatis; corolla extus valde griseo-pubescente, tubo subinfundibuliformi, 5-sulcato, flavido, paullo supra basin constricto, annu-

* A drawing of this plant with analytical details is given in plate 72 C.

loque dense barbato cincto, limbi laciniis 5, oblongis, patentibus, tubo flavido parum longioribus, intus glabris, versus marginem pallescentibus, centro lilacinis, lineis purpureis notatis; staminibus 5 e medio tubi ortis, subæqualibus, filamentis supra geniculum basalem lævem glandula lineari glabra margine densiter villosa donatis, et cum fasciculis totidem tubo adnatis alternantibus hinc faucem claudentibus, superne glaberrimis, attenuatis et longe exsertis, ovario tubi circumscissi reliquo semi-involuto, stylo staminibus paullo longiore, stigmate sub-2-lobo; bacca ovali, coccinea, apiculata, calyce suffulta.—Chile, præsertim in litoribus.—*v. v.**

This may be considered as the type of the many South American species, which form a well-marked group, distinguished principally by their peculiar brachiate pubescence, the hairs being always articulated, often short, and sometimes only visible under the lens: they are also remarkable for the peculiar glandular long adnate scale with fimbriated or barbated margins attached to the lower portion of the stamens, and which by the geniculation of the filaments at their origin, compose a fornix that closes the tube of the corolla: they might almost form a distinct section or subgenus (*Celidophora*). The angles of the branchlets generally exhibit raised reddish-coloured ribs which spring from each side of the bony cupular or bracket-shaped node seen at the origin of each branch or leaf. In this species the leaves are often small, in some cases almost linear, in others ovate, varying from 4 to 8 lines in length, and 1 to 3 lines in breadth: the petiole is almost obsolete: the peduncle is 3 lines, the calyx 2 lines long, which offers the peculiarity of being thickly pubescent within as well as outside; the pointed reflected teeth are a line in length: the tube of the corolla is 2 lines long, the segments of the border 3 lines; the stamens are $2\frac{1}{2}$ lines in length: the scarlet berry is nearly $3\frac{1}{2}$ lines long and $2\frac{1}{2}$ lines broad, and contains numerous small flattened reniform seeds, in which the slender terete embryo makes a gyration and a half, in a spiral form; the radicle, nearly equal in length to the cotyledons, points to the basal angle of the seed, avoiding the lateral hilum. This shrub is very common along the coast of Chile, where it is called *Piquillin*: it is no. 367 of Cuming's collection. I have not seen *L. gracile* of Meyen from the neighbourhood of Coquimbo, referred to this species by M. Dunal, which from the description appears to me to accord better with *L. salsum*, R. & P.

63. *Lycium pubescens* (n. sp.);—ramosissimum, omnino pubescens, ramulis approximatis, horizontaliter divergentibus, spi-

* This plant with sectional details is shown in plate 72 D.

nosis, valde foliosis ; foliis minimis, fasciculatis, anguste linearibus, imo spathulatis, utrinque pubescentibus, pilis mollibus articulatis glutinosis fere tomentosis ; floribus paucis e fasciculis solitariis, brevissime pedunculatis ; calyce urceolato, 5-fido, dentibus linearibus, acutis, corollæ tubo glabro, calyce 2-plo longiore, intus paullo sub faucem fasciculis 5 pilorum staminibus alternantibus donato, limbi laciniis 5, oblongis, margine vix ciliatis, tubo longioribus, staminibus 5, inæqualibus, exsertis, filamentis sub medium tubi insertis, hinc glabris et geniculatis, mox usque ad medium glandula lineari margine hirsuta donatis, superne glabris, 2 longioribus apicem laciniarum attingentibus ; bacca parva, coccinea, calyce (laciniis summo conniventibus) cincta.—In Bonaria australi.—*v. s. in herb. Hook. Tweedie* (Patagonia).

This plant was collected by Tweedie in the southern portion of the province of Buenos Ayres, towards the Rio Colorado and Bahia Blanca—a country always denominated by him "Patagonia." It is wholly covered with a dense yellowish pubescence; the leaves are about $1\frac{1}{2}$ line long, $\frac{1}{4}$ line broad, the peduncle 1 line long, the calyx 1 line, the tube of the corolla $1\frac{3}{4}$ line, the segments of the border a trifle longer; the berry is $1\frac{1}{2}$ line in diameter, enclosed by the embracing lobes of the calyx*.

64. *Lycium Patagonicum* (n. sp.);—subinerme, subglabrum, ramosum, ramulis glabris, angulato-costatis, costis helvolis e cupula conspicua axillari utrinque decurrentibus; foliis alternis, rarius fasciculatis, parvis et ovatis, aut longiusculis et spathulato-linearibus, carnosulis, margine incrassatis, interdum glabriusculis et glanduloso-punctulatis, vel sparse pubescentibus, pilis brevissimis rigidis articulatis aut brachiatis, brevissime petiolatis ; floribus solitariis, calyce 5-dentato, pedunculoque pubescente ; corollæ tubo infundibuliformi, calyce fere duplo longiore, inferne e medio cylindrico, et hinc annulo carnoso crebre piloso extus donato, limbi laciniis 5, oblongis, margine ciliatis, tubo sublongioribus ; staminibus in contractionem tubi insertis, filamentis imo geniculatis, et hinc glandula lineari plana glabra margine fimbriata signatis, subæqualibus, exsertis ; bacca ovata, coccinea, calyce suffulta.—Patagonia.—*v. s. in herb. Hook.* (St. Elena) *Capt. King.*

A plant much resembling in appearance *L. infaustum*, but decidedly different in its floral structure. The leaves are from 2 to 5 lines long, 1 line broad ; the pedicel is $2\frac{1}{2}$ lines, the calyx 2 lines, and the corolla $3\frac{1}{2}$ lines in length ; the tube of the latter

* A representation of this plant with analysis of its flower is shown in plate 72 E.

has five small tufts of hair alternating with the ciliated glands of the filaments; the berry is $2\frac{1}{2}$ lines long and 2 lines broad*.

65. *Lycium scoparium* (n. sp.);—inerme, divaricato- et virgato-ramosum, pilis brevissimis rigidis articulatis et brachiatis ubique hirtulum; ramulis angulato-costatis, glauco-roridis, axillis approximatis, cupulari-nodosis; foliis fasciculatis, anguste vel latiore linearibus, utrinque pubescentibus, in petiolum brevissimum attenuatis; floribus solitariis, breviter pedunculatis, calyce hirsuto, dentibus 5, lineari-acutis, tubo duplo longioribus, sinubus rotundatis, corollæ extus pubescentis laciniis 5, oblongis, patentibus, tubo infundibuliformi paullo longioribus, staminibus exsertis corollæ æquilongis, stylo istis longiore, bacca globosa, coccinea.—In Provinciis Mendozæ et S. Ludovicæ Argentinorum.—*v. v.*

This is an extremely polymorphous species, under which I have united many forms which I formerly considered as distinct species, but as there is little apparent difference in their floral structure they must be regarded as mere varieties. They are all widely spread over the extensive desert plains that skirt the eastern side of the Andes; many even reach the Atlantic: they vary greatly in the shape and size of the leaves even in the same plant, in their more glabrous or pubescent habit, or in a greater abundance or paucity of leaves and flowers. This species is closely assimilated to *L. salsum* and *L. Chilense*, but still more approaching *L. Grevilleanum*. In that variety which I have taken as the type of the species, the whole plant is more pubescent, the leaves linear, somewhat acute, 2 to 5 lines long, $\frac{1}{2}$ to $\frac{3}{4}$ line broad, tapering into a short slender petiole: the peduncle is $\frac{3}{4}$ line long; the tube of the pubescent calyx is $\frac{1}{2}$ line long, its pointed linear teeth 1 line in length; the tube of the corolla is pubescent externally, $1\frac{1}{2}$ line long, the lobes of the border $2\frac{1}{4}$ lines long and $1\frac{1}{4}$ line broad; the nearly equal stamens, 3 lines in length, attain the ends of the segments: the ovary and style are $4\frac{1}{2}$ lines long. I found this plant on the Alto del Yeso, a low mountain range in the province of San Luiz, bordering on that of Mendoza. In this, as in all the other varieties, the stamens exhibit the same peculiar linear gland with fimbriated margins which I have described in the foregoing species, and similar tufts of hair upon the inner face of the tube, alternating with the staminal glands†.

Var. *β. lineare*: the leaves are here more copious, not so pubescent, 6 to 12 lines long, $\frac{1}{2}$ to 1 line broad, but in the same

* This species with floral section is given in plate 72 F.
† This plant with floral analysis is shown in plate 73 A.

specimen often not more than 3 lines in length: this I collected also on the Alto del Yeso as well as the Coral de Desaguadero in the same province*.

Var. γ. *confertifolium*: here the leaves are broader, oblong, and more glandularly pubescent, 4 to 6 lines long, $1\frac{1}{2}$ line broad; the axils are closely approximated at the extremities of the branchlets, so that the fascicles of leaves appear crowded: the branchlets issue from the branches at right angles, or sometimes curving downwards; the cup-shaped nodes are unusually prominent. I found this variety in the province of Mendoza: it is the same as a specimen in Sir Wm. Hooker's herbarium collected by Dr. Gillies (*L. Hookerianum*, Gill. MSS.†).

Var. δ. *divaricatum*: a variety greatly resembling the last in its spreading branches and pale stem, with raised costate lines decurrent from each margin of the cupular nodes; the leaves are similar in form, less dense, quite glabrous, with the exception of the younger leaves, which are slightly pubescent; they are 4 to 7 lines long, 1 to 2 lines broad; the berry is globular, of a crimson colour, and supported by the cup-shaped toothed calyx. I found this growing abundantly in the Travesia or desert tract of Mendoza‡.

Var. ϵ. *affine*: ramulis subvirgatis, strictis, pallide pubescentibus, nodis axillaribus valde prominentibus; foliis fasciculatis, oblongis, utrinque acutis, rigidis, pallide flavescentibus, pilis brevibus brachiatis fere stellatis pubescentibus; floribus solitariis aut geminis, longiusculis, pedunculatis, calyce obconico, acute 5-dentato, pubescente, corolla pilosa.—*v. s. in herb. Hook.* (Mendoza) *Gillies sub nomine* L. affine *MSS.*

The leaves have a yellowish hue when dried; they are from 5 to 7 lines long, $1\frac{1}{2}$ to $1\frac{3}{4}$ line broad, the petiole being almost obsolete: the peduncle is erect, 2 lines long, the very pubescent calyx $1\frac{1}{2}$ line long; the tube of the corolla is $1\frac{1}{2}$ line long, thick, and contracted at base, where it is surrounded by a densely tomentose ring; the segments of the border are 2 lines long, oblong, and extremely pubescent§.

66. *Lycium Grevilleanum*, Gill. MSS. (n. sp.);—inerme, ramis griseis, ramulis pallidis, striatis, pubescentibus; foliis e nodis cupulatis fasciculatis, vel solitariis, spathulato-lanceolatis, vel linearibus, apice calloso submucronatis, margine cartilagineo,

* A figure of this variety with details is given in plate 73 B.
† A representation of this plant with details is given in plate 73 C.
‡ This is shown with floral analysis in plate 73 D.
§ A figure of this variety with sectional details is given in plate 73 E.

carnosis, utrinque ramulisque pilis brevissimis rigidiusculis brachiatis pubescentibus; floribus e fasciculis solitariis, pubescentibus, pedunculo tenui, calyce poculiformi, 5-dentato, dentibus acutis, corollæ tubo imo coarctato annulo barbato cincto, infundibuliformi, limbi laciniis ovato-oblongis, staminibus inclusis, inæqualibus, filamentis in coarctationem tubi insertis, hinc glandula lineari lævi margine dense fimbriata donatis, imo geniculatis, inde glabris, 2 faucem attingentibus, 3 paullo longioribus; stylo subexserto; bacca ovata, sicco fusco-brunnea, calyce suffulta.—In Provinciis Mendozæ et Tucuman Argentinorum.—*v. s. in herb. Hook.* (El Tortoral. *L. Grevilleanum, Gill. MSS.*)

This plant is of straggling bushy habit, and grows abundantly in the moist pasturages to the southward of Mendoza. It much resembles *L. scoparium*, and might almost be considered as a variety of that species, which is equally abundant in drier places; it differs however in having the stamens and style much shorter. The leaves are 5 lines to 1 inch long, 1 to $1\frac{3}{4}$ line broad: the peduncle measures 3 lines; the calyx, $2\frac{1}{2}$ lines long, is divided nearly half-way into five narrow acute erect teeth; the corolla much resembles that of *L. Chilense* in form, size, and colour, and is equally pubescent externally, the tube being $1\frac{1}{2}$ line, and the segments of the border 2 lines in length; the tube a little above its base is much constricted, fleshy, and clothed by a densely barbate ring: the stamens are inserted a little above the constricted portion of the tube, where they are geniculated and glabrous; above this they are each furnished with an adnate fimbriated linear gland, forming together a fornix, that closes the mouth of the corolla over the ovary; the berry is nearly 4 lines long and 3 lines broad*.

67. *Lycium erosum* (n. sp.);—inerme, ramosum, ramulis gracilibus, virgatis, pallidis, striatis, nodis cupuliformibus; foliis alternis, lanceolato-ellipticis, acutiusculis, versus basin attenuatis, vel interdum rotundatis, breviter petiolatis, margine erosis, pilisque glandulosis ciliatis, vetustioribus utrinque glabris et punctis minutissimis elevatis albidis rugosis, junioribus pubescentibus; floribus solitariis pedunculatis, calycis laciniis 5 acutissimis subulato-linearibus tubo brevi costato duplo longioribus, margine ciliatis, sinubus rotundatis, membranaceis, corolla cærulea, lineis violaceis venosis, tubo brevi imo coarctato et annulo dense barbato extus cincto, limbi laciniis 5 oblongis tubo 3-plo longioribus, staminibus 5 longe exsertis, filamentis e coarctatione basali orta, hinc infra glan-

* This plant, with analytical structure of the flower, is shown in plate 73 F.

dulam dilatatam crassam margine dense barbatam geniculatis, 3 limbo æquilongis, 2 paullo brevioribus; bacca oblonga, calyce suffulta.—Frayle Muerto, Prov. Buenos Ayres.—*v. v.*

Specimens of this very distinct species exist also in Sir Wm. Hooker's herbarium, collected by Tweedie in Buenos Ayres, Uruguay, Entre Rios, Banda Oriental, and the banks of the river Parana. It is readily distinguished by its rather large alternate leaves covered with minute white spots, with its margins always unevenly jagged; they are from 4 lines to $1\frac{3}{4}$ inch long, including the short petiole, and from 3 to 6 lines broad; they are sometimes small and more ovate; the older leaves are glabrous, those in the younger axils are large and generally alternate: the peduncle is $2\frac{1}{2}$ or 3 lines long; the calyx including its segments is 2 lines long; the tube of the corolla is 2 lines, the lobes of its border 3 lines long; the tube is encircled in its constricted part by a narrow densely pilose ring, and is bearded internally between the insertion of the stamens; the filaments are thick, fleshy, and geniculated at their origin below the fleshy glands, which form a fornix closing the mouth of the corolla: the berry is crimson, oval, supported by the cup-shaped calyx with its teeth reflexed; it is 3 lines long and 2 lines broad*.

Species incertæ sectionis.

68. *Lycium Gilliesianum* (n. sp.). L. rigidum, *Gill. MSS. non Thunb.*;—imbricato-ramosum, spinosum, ramulis valde flexuosis, griseo-glaucis, spinis validis, longiusculis, divaricatis, approximatis, foliiferis; foliis fasciculatis, glaberrimis, carnosis, spathulato-oblongis, obtusis, in petiolum brevissimum attenuatis; floribus solitariis aut geminis, pedunculo glabro, folio tertio vel dimidio breviori; bacca ovali, calyce 5-dentato suffulta.—Prov. Mendozæ.—*v. s. in herb. Hook.* Copuncoa (*Gillies MSS.*).

This is a very distinct species, much resembling *L. fuscum*, and in all probability is referable to the same section: the branchlets are very flexuose and thick; the strong axillary spines, which are about $\frac{1}{2}$ an inch apart, and 1 or $1\frac{1}{2}$ inch long, bear fascicles of leaves at intervals of every 2 or 3 lines; the leaves are 4 to 7 lines long and 1 line broad; the peduncle is 2 lines long, the calyx about $1\frac{1}{2}$ line in length; the dark-coloured berry 3 lines long and 2 lines in diameter: flowers are wanting in the only specimen I have seen†.

* A drawing of this species with sectional details is given in plate 74 A.

† A figure of this plant is given in plate 74 B.

69. *Lycium Americanum*, Jacq. Stirp. Amer. 50;—frutex orgyalis, elegans, diffusus, ramis teretibus, tenuibus, longissimis, leucophæis, spinis axillaribus, validis et foliiferis; foliis in axillis fasciculatis (3–7), cuneato-oblongis, sessilibus, crassiusculis; floribus solitariis, rarius binis, pedunculatis; calyce campanulato, æqualiter 5-dentato, corolla pollicari, purpureo-albida, tubo infundibuliformi calyce duplo longiore, limbi laciniis 5, rotundato-ovatis, patentissimis, tubo duplo brevioribus, staminibus infra faucem insertis, paullo exsertis, filamentis imo hirsutis, stylo longitudine staminum; bacca pisello minore, obcordato-turbinata, nigra, nitidissima, calyce dimidio breviore suffulta.—San Domingo, in arenosis maritimis.

This species seems to have escaped the notice of botanists, although published ninety years ago, as I do not find it included in the lists of any of the earlier authors, nor in Steudel, Walpers, or yet more modern arrangements. The characters given by Jacquin appear to conform with those of *Lycium*: the only genus with which it is likely to be confounded is *Dunalia*. It is described as a handsome shrub with crowded leaves, and its flowers must be the largest in the genus. From 5 to 7 leaves are fasciculated in each axil; they are sessile, tapering from the summit to the base, quite smooth, fleshy, nearly an inch long; the calyx is 3 lines long, the corolla is slender and an inch in length.

Lycia exclusa.

L. aggregatum, *R. & P.*	= Acnistus aggregatus, *Miers.*
L. angustifolium, *Mill.*	= Lycium tenue, *Willd.*
L. apiculatum, *Dun.*	= Lycium cinereum, *Thunb.*
L. arborescens, *Hook.*	= Acnistus aggregatus, *Miers.*
L. Barbarum, *Lour.*	= Lycium vulgare, *Dun.*
L. barbatum, *Thunb.*	= Plectronia ventosa, *L.*
L. Boerhaavifolium, *L.*	= Grabowskya Boerhaavifolia.
L. campanulatum, *E. Mey.*	= Lycium Afrum, *L.*
L. canum, *Gill.*	= Lycium Chilense, *Miers.*
L. Capense, *Mill.*	= Lycium tetrandrum, *Thunb.*
L. capsulare, *L.*	= a genere et ab ordine certe expellendum.
L. Chinense, *L.*	= Lycium vulgare, *Dun.*
L. ciliatum, *Schl.*	= Salpichroma ciliatum, *Miers.*
L. Cochinchinense	= Lycium vulgare, *Dun.*
L. cordatum, *Mill.*	= certe non Lycium ob foliis oppositis cordatisque.
L. cornifolium, *H. B. K.*	= Chænesthes cornifolia, *Miers.*
L. distichum, *Mey.*	= e genere et forsan ab ordine repellendum *.

* This plant, found by Meyen in the Cordillera of Southern Peru, has been referred to *Lycium* and *Grabowskya*, but it appears to me that it cannot belong to either: its long simple distichous patent branches, termi-

L. fœtidum, *L.* = Lerissa fœtida.
L. floribundum, *H. B. K.* (*non Dun.*) = Acnistus floribundus, *G. Don.*
L. fuchsioides, *H. B. K.* } = Chænesthes fuchsioides, *Miers.*
L. fuchsioides, *hort.* }
L. gesnerioides, *H. B. K.* = Chænesthes gesnerioides, *Miers.*
L. gracile, *Meyen* = Lycium salsum, *R. & P.*
L. grandiflorum, *Willd.* = Acnistus grandiflorus, *Miers.*
L. Guayaquilense, *H. B. K.* = Acnistus Guayaquilensis, *G. Don.*
L. halimifolium, *Mill.* = Lycium barbarum, *L.*
L. heterophyllum, *Murr.* = Grabowskya Boerhaavifolia, *W.-Arn.*
L. horridum, *Thunb.* = Lycium tetrandrum, *Thunb.*
L. horridum, *H. B. K.* = Lycioplesium horridum, *Miers.*
L. Indicum, *Retz.* (*non R. Wight*) = Lerissa fœtida, *Comm.*
L. inerme, *L. f.* = Plectronia ventosa, *L.*
L. Japonicum, *Thunb.* = Lerissa fœtida, *Comm.*
L. lanceolatum, *Poir.* = Lycium vulgare, *Dun.*
L. Loxense, *H. B. K.* = Chænesthes Loxensis, *Miers.*
L. macranthum, *Buching.* = Rhizogum trichotomum, *Burch.*
L. macrophyllum, *Benth.* = Acnistus Benthami, *Miers.*
L. Mediterraneum, *Dun.* = Lycium Europæum, *L.*
L. megistocarpum, *Dun.* = Lycium vulgare, *Dun.*
L. Meyenianum, *N. ab E.* = Lycioplesium Meyenianum, *Miers.*
L. microphyllum, *H. B. K.* = Lycioplesium horridum, *Miers.*
L. microphyllum, *Duh.* = Lycium carnosum, *L.*
L. nutans, *Pöp.* = Lycium Chilense, *Miers.*
L. obovatum, *Buching.* = Ehretia Capensis, *Meisn.*
L. obovatum, *R. & P.* = Lycioplesium obovatum, *Miers.*
L. obtusum, *Willd.* = Chænesthes umbrosa, *Miers.*
L. ovale, *Willd.* } = Chænesthes cornifolia, *Miers.*
L. ovatum, *Willd.* }
L. ovatum, *Duh.* = Lycium vulgare, *Dun.*
L. parvifolium, *R. & Sch.* = Lycioplesium pulchellum, *Miers.*
L. propinquum, *G. Don* = Lycium Afrum, *L.*
L. pulchellum, *Mart. & Gall.* = Lycioplesium pulchellum, *Miers.*
L. Quitense, *Hook.* = Pœcilochroma Quitense, *Miers.*
L. quadrifidum, *Moçino et Sessè* = Lycium Carolianum, *Mich.*
L. Ruthenicum, *Dun.* (*non Murr.*) = Lycium Tataricum, *Pall.*
L. scabrum, *N. ab E.* = Lycium scoparium? *Miers.*
L. salicifolium, *Mill.* = Lycium Europæum, *L.*
L. salsum, *Bartr.* (*non R. & P.*) = Lycium Carolianum, *Mich.*
L. serpyllifolium, *Dun.* = Peliostomum serpyllifolium, *Miers.*

L. Shawii, *R. & Sch.* = Lycium barbarum? *L.*

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nating in a spine, indicate an opposition, not an alternation of its axils and leaves; its leaves are described as minute, but not as being clustered or fascicled; the corolla of its solitary flowers is cæruleous, with a large funnel-shaped limb and small erect segments, together with included stamens. There is little here conforming to *Lycium* or *Grabowskya*. In its peculiar habit, its minute leaves, its calyx, the colour and shape of its flowers, it approaches more closely to the curious Bignoniaceous plant which I found in the Cordillera of Mendoza, and which I described under the name of *Oxycladus aphyllus*, a supposition rendered still more probable from the analogous locality of its origin.

L. Sinense, *hort.* = Lycium ignarum, *Miers.*
L. spathulatum, *R. & P.* = Acnistus spathulatus, *G. Don.*
L. spathulatum, *Math.* = Dunalia acnistoides, *Miers.*
L. subglobosum, *Dun.* = Lycium vulgare, *Dun.*
L. Thunbergii, *G. Don* = Lycium oxycarpum? *Dun.*
L. Trewianum, *Duh.* = Lycium vulgare, *Dun.*
L. turbinatum, *Duh.* = Lycium vulgare, *Dun.*
L. umbellatum, *R. & P.* = Acnistus umbellatus, *Miers.*
L. umbrosum, *H. B. K.* = Chænesthes umbrosa, *Miers.*

Pionandra.

The details of this genus as given in Lond. Journ. Bot. iv. 353, and in the first volume of this work, p. 34. pl. 8 & 9, were first drawn up during my stay in the Organ Mountains in 1837, but not published till 1845, and while these were in type, Dr. Sendtner contributed to the Munich flora his genus *Cyphomandra*, identical with the above, so that by a month's priority in publication, the latter name has claimed the preference. I there divided *Pionandra* into two very distinct sections. 1. *Ceratostemon*, which corresponds with Dr. Sendtner's genus, and is distinguished (as both names imply) by their fleshy and curved stamens, and more or less obconical style and stigma, which are often as short and thick as the ovarium itself. 2. *Euthystemon*, comprising those species noted for having the anthers much longer, thinner, and very straight; the style being slender, terete, with a much smaller clavate stigma: the analytical details of the former section are shown in plate 8, and of the second section in plate 9 as above referred to. M. Dunal in his monograph of the genus, subsequently published in DC. Prodr. xiii. 387, amplifies Dr. Sendtner's *Cyphomandra*, by the introduction of the plants of my section *Euthystemon*, thus increasing the number of species to thirty-four; he classifies those of the former section into five, and of the latter section into three subdivisions, after Dr. Sendtner's plan, according to the relative lengths of the connective and the style. There are many circumstances that make it desirable to keep these two groups quite distinct, having such marked characters; and when Dr. Seemann submitted to my examination the Solanaceous plants of his Panama collection, I ventured, in describing a new species, to suggest to him my views on this head, when he had the kindness to publish them, together with my note on the subject, in his 'Botany of the Herald.' I there proposed to retain in Dr. Sendtner's genus *Cyphomandra*, those species where the anthers are much curved, often rostrate at the apex (as in *C. betacea* and *C. sycocarpa*); the cells being verrucosely crumpled in front, as in many *Melastomaceæ*, and partly imbedded in a fleshy connective, which is dorsally gibbous at the base; the

filaments broad and often dilated suddenly, being connected by their bases upon a fleshy ring adnate to the base of the corolla; the style being generally shaped like an inverted cone, more or less thick, and the fruit being a large oval berry, often used for culinary purposes as a substitute for Tomates. They are generally tall shrubs, with large fleshy cordate leaves, emitting a strong, unpleasant smell. This group consists of *Cyphomandra calycina, physaloides, sycocarpa, lobata, diploconos, floribunda, ciliata, fragrans, sciadostylis, premnæfolia, corymbiflora,* and *viriflora*.

For the second group, I propose to retain my generic name of *Pionandra,* which will include those species formerly designated under the section *Euthystemon,* together with some others that will be indicated below. This genus differs from *Cyphomandra* in its lengthened, straight, erect, and narrower stamens, almost rostrate at the summit below the apical knob, which bursts obliquely in front, forming two bilabiate gaping pores; the pollen-cells also burst below by longitudinal fissures; it has likewise an elongated fusiform hollow style, with its small stigmatic glands wholly included. The latter genus, on the contrary, is remarkable for its thicker and shorter anthers greatly curved upon a fleshy gibbous connective, and for its peculiar style, which is generally short, thick, in the form of an inverted cone, with large distinct stigmatic glands in its mouth: these peculiar features are shown in plate 8 of the first volume of this work, in plates 15, 16 and 17 of Dr. Sendtner in 'Flor. Brasil.' fasc. vi., and in plate 227 of Martius, 'Nov. Gen. et Spec. Bras.' The generic character of the genus *Cyphomandra* with a few omissions will therefore remain as formerly designated by me under *Pionandra* (as above referred to, i. 34), while that of the latter genus, as now restored and modified, and of which I will add another species with pinnatifid leaves (as in *C. fraxinella,* Sendt.) collected by me in the Organ Mountains, may be summed up as follows:—

Pionandra, nob. (gen. reformatum). *Calyx* 5-partitus, persistens. *Corolla* hypogyna, tubo brevi, limbo amplo 5-partito, laciniis 5 lanceolatis, subtenuibus, æstivatione introflexo-valvatis. *Stamina* 5 æqualia, erecta, stylo circumdantia; *filamenta* brevissima, complanata, in annulum brevem tubo corollæ adnatum imo connata; *antheræ* magnæ, rectæ, superne rostratæ, 2-loculares, loculis elongatis ad connectivum parallele adnatis, rima longitudinali sæpe dehiscentibus, summo globoso-capitatis, hinc antice poris 2 transversim et oblique valvatis, valvibus bilabiatis latissime hiantibus. *Ovarium* oblongum, 2-loculare, placentis carnosis utrinque dissepimento

adnatis, multiovulatis. *Stylus* longiusculus, teres, subtenuis, apice longe incrassatus et hinc cavus. *Stigma* in cavo omnino immersum, glandulosum. *Bacca* pulposa, 2-locularis. *Semina* numerosa: cætera ignota.—Suffrutices *in America intertropica indigenæ, ramosissimæ*; folia *petiolata, subgemina, elliptica, integra vel profunde lobata aut pinnatifida*; racemi *extra-axillares*, flores *secundi*, pedicellis *articulatis sæpe deciduis.*

§ 1. *Folia integra.*

1. *Pionandra capsicoides*, nob. huj. op. i. 41. tab. 9; Sendt. Fl. Bras. vi. 123. Cyphomandra capsicoides, *Dun. in DC. Prodr.* xiii. 396.
2. *P. divaricata*, nob. loc. cit. i. 41. Witheringia divaricata, *Mart. Nov. Gen. Bras.* iii. 75. tab. 228. Cyphomandra divaricata, *Sendt. Flor. Bras.* vi. 118; *Dun. l. c.* 397.
3. *P. laxiflora*, nob. Cyphomandra laxiflora, *Dun. l. c.* 397. Solanum laxiflorum, *Dun. in h. Banks.*
4. *P. oxyphylla*, nob. Cyphomandra oxyphylla, *Dun. l. c.* 396.
5. *P. Hartwegii*, nob. l. c. i. 43. Cyphomandra? Hartwegii, *Dun. l. c.* 401.
6. *P. velutina*, nob. Cyphomandra velutina, *Sendt. Fl. Bras.* vi. 120. tab. 17; *DC. Prodr. l. c.* 398.
7. *P. elliptica*, nob. Cyphomandra elliptica, *Sendt. l. c.* 121; *DC. Prodr. l. c.* 398. Solanum ellipticum, *Vell. Fl. Flum.* ii. tab. 100.
8. *P. cylindrica*, nob. Cyphomandra cylindrica, *Sendt. l. c.* 121; *DC. Prodr. l. c.* 399. Solanum cylindricum, *Vell. l. c.* tab. 119.
9. *P. coriacea*, nob. *l. c.* p. 43. Cyphomandra? coriacea, *Dun. in DC. Prodr. l. c.* 401.
10. *P. Cajanumensis*, nob. l. c. Cyphomandra? Cajanumensis, *Dun. in DC. Prodr. l. c.* 401. Solanum Cajanumense, *H. B. K.* iii. 47.

§ 2. *Folia pinnatisecta vel pinnata.*

11. *P. fraxinella*, nob. Cyphomandra fraxinella, *Sendt. l. c.* 122; *DC. Prodr. l. c.* 399. Solanum Martii, *Dun. MSS.*
12. *P. cornigera*, nob. Cyphomandra cornigera, *Dun. l. c.* 401.
13. *P. allophylla*, nob. in Seemann, Bot. Herald, p. 174.
14. *P. pinnata* (n. sp.);—subscandens, glabriuscula, dichotome ramosa, ramulis teretibus, fistulosis, junioribus brevissime pubescentibus; foliis distantibus geminis, altero breviori, impari-pinnatis, petiolo longissimo, imo subglabro, superne tomentoso, foliolis circiter 11, sæpe oppositis, interdum alternis,

longe lanceolatis, anguste acuminatis, in texturam tenuibus, supra sparse pilosis, subtus pallidioribus, costa media nervisque hirsutulis, breviter petiolulatis, petiolulo tomentoso, folio terminali alteris longiori et longius petiolulato; racemo longe extra-axillari, elongato, imo nudo, sub-10-flore, floribus alternis, flavis, glabris, subsecundis, pedicellis longiusculis, pilosulis, apice valde incrassatis, imo articulatis, infimis deciduis.—Brasilia (in Montibus Organensibus, Prov. Rio de Janeiro).

I found this plant on the skirts of the extensive forests of the Organ Mountains; the branchlets are green, smooth, round, marked with numerous minute whitish specks, woody but fistular, and somewhat flexuosely geniculated at the nodes, which are 3 or $3\frac{1}{2}$ inches apart. The leaves are about 10 inches long; the petiole diverges nearly at a right angle from the stem, and is bare for the length of 2 inches; the leaflets are generally in opposite pairs, about 1 inch apart, though often alternate; the lowermost are shorter, scarcely more than an inch long, upon tomentose petioles of a line in length; the upper ones are 3 inches long, 7 lines broad, on a petiole of $1\frac{1}{2}$ line; and the terminal one is 8 lines broad and 4 inches long, exclusive of its petiole of half an inch. The raceme issues from the stem upon the same side as the leaf, but at a distance of 2 inches above the axil; it is quite glabrous, about 5 inches long, the lower portion for a length of 3 inches being bare of flowers, but from this point eleven pedicels, each bearing a single flower, spring secundly; they are suddenly thickened below the calyx, are about 8 lines long, and are articulated at their base, the lower ones generally falling away, and leaving cicatrices at the points of their insertion. The calyx is short, with five triangular teeth; the corolla is about 5 lines long, has a short tube scarcely exceeding a line in length, the border being divided into five equal, oblong segments, which are quite smooth, with woolly margins: the stamens are the length of the corolla, the filaments are extremely short, and arise from an adnate 5-toothed ring fixed to the tube; the ovary is short, smooth, not longer than the calyx; the style is slender, somewhat thickened above, and hollow for half its length*.

Cliocarpus.

It is now more than five years since I proposed this genus for a Brazilian plant collected in the province of Minas Geräes by my friend the late Mr. Gardner. The generic outline given (*huj. vol. p.* 31) was incomplete, as I had then only seen it in fruit, but I am at length able to add its floral character. The

* A drawing of this plant with its floral analysis is given in plate 74.

appearance of its saccate ventricose calyx and berried fruit led me to suppose it offered most analogy with *Nicandra*, but this I find is not the case, as it belongs to the true *Solanaceæ*, and to the tribe *Solaneæ*, taking its place between *Pionandra* and *Triguera*. In the structure of its stamens and style there is much resemblance to the former genus: the anthers are erect; the lobes are long, parallel, and contiguously adnate upon a dorsal furrowed connective; they are thin in texture, each being 2-locellate, owing to the existence of a somewhat oblique, slender, complete partition that divides each lobe, which is 2-valvular, and its dehiscence takes place by a longitudinal slit near the outside of the anterior face, caused by the separation of the margins of the valves from the edge of the contracting partition, so that after bursting, each lobe thus appears to be unilocular: this separation is more constant at the summit, where the line of dehiscence crosses the face diagonally towards the middle of the anther, when the broad upper valve is thrown back in an auricular form and into an erect position, while the narrower lower lip is reflected downward, thus showing a broad oblong gap divided by the line of the septum, and forming a continuation of the lateral fissure: each anther is deeply 2-lobed at its base, and is attached at the bottom of its dorsal groove to the apex of a sigmoid-shaped filament, which crosses it abruptly to the front, so that the anther appears fixed astride upon it: the filaments are short and closely surround the ovary, they are compressed, somewhat broad, deeply channelled, being often enlarged in the middle by two auricular erect margins; they are joined together by a narrow, fleshy, annular ring, which is united by its base to the foot of the corolla. The calyx is formed of five lanceolate, acute leaflets distinct nearly to its base, which consists of a small inverted cup, having five saccate cavities alternating with the segments; these segments are at first expanded, but after the fall of the corolla they collapse, increase considerably in size, become yellowish, reticular, and more membranaceous in texture; their margins approximate and turn outwards, thus forming a somewhat pointed, 5-toothed, globosely ventricose pentagonal tube with salient winged angles, which are saccate at their base as above mentioned, thus greatly resembling in shape that of *Nicandra* or *Physalis* in fruit: the segments are densely covered on both sides with glandular, simple, and stellated hairs intermixed. The corolla is nearly the length of the calyx, is cleft almost to the base, where it is briefly tubular; the segments, which scarcely exceed the stamens in length, are expanded, smooth inside, with a keeled medial nervure, and outside are densely tomentose with stellated pubescence. The ovary is conically ovate; the style is slender, erect, fusiform at

the apex, and terminated by two minute teeth: the berry is round, about the size or smaller than a common pea, 2-celled, and contains a few large, compressed, reniformly-orbicular seeds. I have ascertained that the *Solanum megalochiton* of Dr. Sendtner, and *S. didymum* of M. Dunal, both belong to this genus; *S. eriocalyx*, from its description, also appears to be congeneric with them, and probably other species of *Solanum*, enumerated by M. Dunal in his monograph, will find a place here. Its generic features may be thus described:—

CLIOCARPUS (char. reform.). *Calyx* profunde 5-partitus, utrinque stellato-tomentosus, rarissime simpliciter pilosus, imo patellaris, circa pedicellum umbraculiformis, et secus sinua 5-saccatus, laciniis expansis, lanceolatis, acutis, in fructu auctus, tunc laciniis erectis (ut in *Nicandram*) marginibus refractis hinc valvatim conniventibus, tubum ventricosum carinato-5-gonum ore 5-dentato fere clauso simulantibus. *Corolla* subrotata, calyce plus minusve æquilonga, 5-fida, laciniis æqualibus, tubo æquilongis vel longioribus, subacutis, apice inflexis, extus tomentosis, intus glabris, nervo medio prominulo. *Stamina* 5, æqualia, corollæ fere longitudine; *filamenta* brevissima, glabra, ex annulo carnoso imo tubi adnato 5-sinuato orta, valde sigmoidea, complanata, sulcata, apice acuta: *antheræ* magnæ, erectæ, circa stylum conniventes, oblongæ, 2-lobæ, 4-locellatæ, basi breviter bifidæ, ad imum sulci dorsali affixæ, lobis sine connectivo conspicuo parallele adnatis, sulco longitudinali et summo præcipue utrinque rima antica obliqua valvatim late hiantibus, valvula superiori hinc erecta auriculæformi, inferiori fere obsoleta. *Ovarium* glabrum, subrotundum, 2-sulcatum, 2-loculare, ovulis plurimis dissepimento placentifero carnoso utrinque adnatis. *Stylus* simplex, filiformis, staminibus dimidio longior. *Stigma* minutum, brevissime bifidum, dentibus acutis, divaricatis vel adpressis. *Bacca* calyce aucto inclusa, subglobosa, 2-locularis: *semina* pauca, reniformia, compressa, *testa* scrobiculata, *hilo* in sinu laterali; *embryo* teres, in *albumen* carnosum spiraliter arcuatus, *cotyledonibus* semi-teretibus, *radicula* angulo basali spectante, hiloque evitante sub-3-plo brevioribus.—Frutices *Brasilienses, pilis simplicibus* (*plerumque cum stellatis intermixtis*), *dense tomentosi*: folia *alterna, vel sæpe gemina, altero minori, integra, oblonga, acuta, imo obtusa, interdum cordata, breviter petiolata*: flores *extra-axillares, solitarii aut bini, vel in racemo sub-umbellæformi plures aggregati*, pedicellis *longis, filiformibus, fructiferis cernuis.*

1. *Cliocarpus Gardneri*, nob. huj. op. p. 35, Plate 44; DC. Prodr. xiii. 675;—fruticosus, subdichotome ramosus, ramis

tomentosis; foliis obovatis, e medio acuminatis, basi subrotundatis, sæpe geminis, altero dimidio vel paullo adhuc minori, crassiusculis, supra læte viridibus et pubescentibus, subtus densissime cano- vel flavido-tomentosis, pilis simplicibus cum alteris stipitato-stellatis intermixtis, nervis venisque supra impressis, subtus prominulis et flocculosis, petiolo brevi, crassiusculo : floribus extra-axillaribus, solitariis vel 2–4-fasciculatis, pedunculo obsoleto, pedicellis filiformibus, quam congeneribus longioribus, in fructu deflexis et magis elongatis; bacca pisi majoris magnitudine, nigra, calyce aucto subvesiculari flavo-membranaceo reticulato clausa.—Brasilia, Prov. Minas Geräes.—*v. s. in herb. Hook.* (Arraial das Mercês, *Gardner*, no. 5042).

This plant in fruit has been already described, as above quoted, but I have since found flower-buds, which, though very young, are quite sufficient to identify the same structure as in the two following species; the only difference being, that here the corolla seems to be more deeply cleft than in the others.

2. *Cliocarpus megalochiton.* Solanum megalochiton, *Mart. and Sendtn. Fl. Bras.* vi. 28. tab. 9; *DC. Prodr.* xiii. 124;—dichotome ramosus, ramulis divaricatis, inferne glabris, superne hirsuto-tomentosis; foliis non raro geminis, altero multo minori, ovatis vel ovato-lanceolatis, acuminatis, basi rotundatis, inæquilateris et oblique subcordatis, supra fusco-viridibus, velutinis et sparse villosulis, subtus griseo-tomentosis et pilis stipitato-stellatis densissime tectis, nervis arcuatis venisque superne impressis, subtus valde prominentibus, petiolo brevi tomentoso; racemis paucifloris, terminalibus, dein lateralibus et subopppositifoliis, pedicellis pedunculo brevioribus, creberrime secundis, imo articulatis, inferioribus valde deciduis, superioribus 3–8 pseudo-umbellatis, demum in fructu deflexis, quam præcedenti multo brevioribus; calyce etiam persimile sed paullo minori; corolla intus cærulea? et glabra, extus stellato-tomentosa, filamentis brevibus, medio auriculatis, marginibus inflexis; stylo tenui, staminibus dimidio longiori, apice brevissime divaricato-2-dentato : bacca nigra, pisi minoris magnitudine.—Brasilia, Prov. Rio de Janeiro.—*v. s. in herb. Mus. Brit.* (*Bowie et Cunningham ad* S. João Marcos) *sub nom. Cl. Dunalii* "Solanum melanocarpum et Solanum laxum."—*in herb. Hook.* (*Claussen*).

This species appears to have been collected by Dr. von Martius and by Schott in the Corcovado range, by Llotschy in the Organ Mountains, who considered it to be a *Physalis* on account of its ventricose calyx, and was also found by Sello in other parts

of the same province. It is readily distinguished from the former species by its more lax habit, more divaricate branches, and its different inflorescence. Its leaves are from 2 to 3 inches long, 1 to 1½ inch broad, on a petiole of 2 lines. The peduncle of the raceme is from 6 to 9 lines long, sometimes even shorter; its pedicels 4 to 6 lines in length when in flower, and 9 lines in fruit: the flower expanded is about 8 lines in diameter; the calyx when collapsed in fruit is about 5 lines in diameter, and when its segments are expanded, according to Dr. Sendtner, 12 to 15 lines across: the berry when ripe is smooth and black, 4 lines in diameter, and contains about sixteen seeds. M. Dunal describes two varieties in the 'Prodromus,' citing as his authority, plants observed by him in the British Museum; but I find there only a single specimen with two separate tickets attached to it, bearing his autograph names of *Solanum melanocarpum* and *Solanum laxum*, from which we may infer that his notes have been taken at different times, and after a lapse of many years concluded to be those of two separate plants*.

3. *Cliocarpus didymus*. Solanum didymum, *Dun. in DC. Prodr.* xiii. 125 (*olim S. divaricatum*, Dun. MSS.). Solanum gemellum, *Mart. & Sendtn. Flor. Bras.* vi. 28;—valde dichotomo-ramosus, ramulis divaricatis, teretibus, primum ochraceo- et fusco-tomentosis, dein glabris; foliis supremis geminis, altero ter quaterve minori, brevissime petiolatis, ovatis vel ovato-lanceolatis, apice acuminatis, basi inæqualiter rotundatis, vix cordatis, supra velutinis, subtus molliter albido- ochraceo- vel ferrugineo-stellato-tomentosis, nervis arcuatis, sub 5-jugis, venisque superne impressis, subtus prominentibus et flocculoso-tomentosis; floribus cymoso-racemosis, confertis, paucis, dense stellato-tomentosis, terminalibus dein lateralibus et oppositifoliis, pedicellis pedunculo brevissimo duplo longioribus, quam præcedentibus brevioribus; calycis laciniis oblongis, subito acutis; corolla calyce paullulo longiori, semi-5-fida, campanulato-rotata, intus glabra; staminibus corolla dimidio brevioribus, hiatibus apicalibus latis, cum rimis longitudinalibus continuis; ovario brevi, stylo tenui, demum longe exserto, stigmate fere obsoleto; bacca subovali, piso minori, lævi.—Brasilia, in provinciis interioribus.—*v. s. in herb. Mus. Brit.* (*Bowie & Cunningham*) Prov. S. Paulo *sub nom. Cl. Dunalii* "Solanum divaricatum."—*in herb. Hook.* (*Claussen*) Cachoeira do Campo Prov. Minas Geräes.

This species was found also by Sello in the province of San Paulo. M. Dunal describes the varieties of *glabrum* and *tomen-*

* The floral details of this plant are given in the drawing of the preceding species in Plate 44.

tosum, but they seem to be different states of the same plant varying with its age. Its leaves are from 2 to 4 inches in length, 8 to 13 lines in breadth, upon a petiole 2 to 4 lines long: the peduncle of the inflorescence is not more than 4 to 6 lines in length, often much shorter; the pedicels being 2 to 4 lines long, and when in fruit 6 to 8 lines in length; the corolla expanded is 8 lines in diameter; the stamens are 2 lines long; the enlarged calyx enveloping the fruit forms a sphere of 8 lines in diameter.

4. *Cliocarpus*? *eriocalyx*. Solanum eriocalyx, *Dun. in DC. Prodr.* xiii. 124;—ramis divaricatis, flexuosis, piloso-scabriusculis, ramulis foliis utrinque, pedunculo, pedicellis, calyce quaquaversus, corollaque extus pilis longis simplicibus hirsutis, foliis sæpe geminis, altero minori, ovato-oblongis, acuminatis, basi inæqualibus frequenter auriculatis, ciliatis, flavicantibus, costa media nervisque prominulis, petiolatis, folio altero ter quaterve minori, ovato-rotundato, subsessili; racemis brevibus, hirsutis, sub-oppositifoliis, 7–8-floris, pedicellis elongatis, filiformibus, confertis, sub-umbellatis: calyce rufescente, pilis sordide albis hirsutis, laciniis ovato-oblongis, apice subnudis; corolla semi-5-fida, laciniis lanceolatis, acutis; antheris gracilibus, linearibus, apice præcipue auriculato-hiantibus; stylo filiformi; bacca subglobosa, calyce amplo obvoluta.—Brasilia (Lund).

This plant, from the above details founded on the description of M. Dunal, appears to conform closely with the three preceding species in all respects, except in the mention of stellated pubescence intermixed with simple hairs: as it is arranged by M. Dunal between the two last-described species, it may be safely inferred to be congeneric with them. The leaves are said to be 2–2½ inches long, 10 to 13 lines broad, on a petiole 1 or 2 lines in length: the twin leaf is 7 lines long and 6 lines broad: the peduncle is 2 or 3 lines long, with seven or eight almost umbellate slender pedicels 7 to 9 lines long: the calyx is 4 or 5 lines in diameter.

Pœcilochroma.

As it is always better to retract an error when its ill tendency becomes apparent, I do not hesitate to do so in the following cases. Not long since (*huj. op.* xi. p. 57), bearing in view the fact I had discovered, that the typical species of *Witheringia*, L'Hér., belonged to the genus *Saracha* of the 'Flora Peruviana,' and under the influence of too much eagerness to follow the strict rule of science, I recommended that all the plants of this latter genus should be called *Witheringia*, as a title of older date; also that the name of *Pœcilochroma* should be suppressed, and its different species referred to *Saracha*. Several of my botanical

friends have pointed out to me the great inconvenience of changing the names of plants so numerous and so long known and cultivated in our gardens, adding that it is always desirable on the score of expediency to forego a rigid law, where the adoption of it is attended with so much inconvenience, by the multiplication of puzzling synonyms. Fully impressed with the force of this argument, I propose to adhere to my original plan of retaining the name of *Witheringia*, as defined by Von Martius, for the plants enumerated *huj. op.* pp. 5 & 6, and preserving that of *Pœcilochroma* as before established, while *Saracha* will remain attached to those plants by which they have been extensively known for so many years. The synonyms recommended (*huj. op.* xi. pp. 56 & 57) should consequently be expunged, when the species will stand thus :—

	Ill. So. Am. Pl.	DC. Prodr.
1. Saracha solanacea, *nob.* (Witheringia id.) ...	ii. 21	xiii. 402
2. —— villosa, *Don* ..... „	ii. 16	xiii. 430
3. —— contorta, *R. & P.* ... „	ii. 16	xiii. 430
4. —— Zuccagniana, *R. & S.* „	ii. 16	xiii. 430
5. —— biflora, *R. & P.* ... „	ii. 16	xiii. 431
6. —— procumbens, *R. & P.* „	ii. 16	xiii. 431
7. —— umbellata, *G. Don* ... „	ii. 16	xiii. 431
8. —— alata, *Dun.* ..... „		xiii. 431
9. —— jaltomata, *Schl.* ..... „	ii. 16	xiii. 432
10. —— allogona, *Schl.* ..... „	ii. 16	xiii. 432
11. —— dentata, *R. & P.*..... „	ii. 16	xiii. 432
12. —— viscosa, *Schr.* ..... „	ii. 16	xiii. 433
13. —— ciliata, *nob.* ..... „	ii. 16	xiii. 683
14. —— propinqua, *nob.* ..... „	ii. 17	xiii. 683
15. —— diffusa, *nob*..... „	ii. 17	xiii. 683
16. —— laxa, *nob*..... „	ii. 18	xiii. 683
17. —— auriculata, *nob.* ..... „	ii. 18	xiii. 683
18. —— conspersa, *nob.* ..... „	ii. 19	xiii. 684
19. —— glabrata, *nob.* ..... „	ii. 19	xiii. 684
20. —— acutifolia, *nob.* ..... „	ii. 19	xiii. 684
21. —— vestita, *nob*..... „	ii. 20	xiii. 684
22. —— glandulosa, *nob.* ..... „	ii. 20	xiii. 684
23. —— Miersii, *Dun.* (S. diffusa, *nob. bis*) ...	ii. 22	xiii. 684

	Ill. So. Am. Pl.	DC. Prodr.
1. Pœcilochroma punctatum, *nob.*	i. 153	xiii. 495
2. —— frondosum, *nob.*	i. 154	xiii. 495
3. —— guttatum, *nob.*	i. 155	xiii. 495
4. —— maculatum, *nob.*	i. 156	xiii. 495
5. —— Lobbianum, *nob.*	i. 157	xiii. 496
6. —— Lindenianum, *nob.*	i. 157	xiii. 496
7. —— Quitoënse, *nob.*	i. 157	xiii. 496
8. —— Boisseri, *Dun.*		xiii. 495
9. —— Funkiana, *Dun.*		xiii. 687
10. —— Sellowiana, *nob.* (Witheringia id., *Sendt.*)		iii. 403

	Ill. So. Am. Pl.		DC. Prodr.
1. Witheringia picta, *Mart.* ...	ii. 5	(Athenæa id., *Sendt.*) .	xiii. 458
2. —— pogogena, *nob.*	ii. 5	„ „ ...	xiii. 459

	Ill. So. Am. Pl.		DC. Prodr.
3. Witheringia micrantha, *nob*...	ii. 5	(Athenæa id., *Sendt.*) .	xiii. 460
4. —— Schottiana, *nob.*	ii. 5	„ „ ...	xiii. 461
5. —— Pohliana, *nob.*	ii. 5	„ „ ...	xiii. 461
6. —— Martiana, *nob.*	ii. 6	„ „ ...	xiii. 462
7. —— hirsuta, *nob.*	ii. 6	„ „ ...	xiii. 463
8. —— anonacea, *nob.*	ii. 6	„ „ ...	xiii. 463

The seven new species of *Witheringia* from Chile enumerated by Remy (Walp. Ann. iii. 160) do not appear to belong to this genus: the four last seem related to *Solanum tuberiferum*, Dun. (olim *Witheringia montana*, Dun., *Solanum montanum*, R. & P.), but the floral characters there given are not sufficient to determine their true place.

On the Genus Triguera *of* Cavanilles; *by* John Miers, Esq., F.R.S., F.L.S., &c.

Triguera.

This hitherto obscure genus was first described in 1786 by Cavanilles (Diss. 2. Append. 2. tab. A.), where a rough figure is given of one of its species. Poiret also, in the Dict. Meth. vol. viii. p. 99, offers a tolerably good description of the two enumerated species, and Lamarck in his Illustr. Tab. 114, has copied Cavanilles' drawing of *T. ambrosaica*; these authors correctly class the genus among the *Solanaceæ*. At a much later period it was, however, referred by Don to the *Nolanaceæ*, evidently from a misconception of its fruit; but by Endlicher and other botanists, it has since been placed at the end of *Solanaceæ*, as a doubtful genus of the order. Indeed nothing certain seems to have been known of its structure, and it is strange that a plant, apparently widely diffused throughout the south of Spain, should have altogether escaped the notice of all botanists except M. de Boissier, during the last forty years; it seems at all events to have been quite unknown to English botanists, not a single specimen, so far as I can trace, having existed in any British herbarium. I have been fortunate in obtaining much satisfactory information on this subject, and feel greatly indebted to M. de Boissier, whom I had the pleasure of seeing this summer in Geneva, for the kind and generous manner in which he opened to me the contents of his rich herbarium, and for his liberality in giving me a specimen of *Triguera ambrosaica*, from which I have made the following analysis. *Triguera*, from the facts thus collected, will be seen to be not only a truly Solanaceous genus, but one closely allied to *Solanum*: in the structure of its stamens, and their arrangement upon the outside of a free epipetalous annular ring surrounding the ovarium, it approaches the genus I described on a former occasion (Ill. So. Am. Pl. p. 33. tab. 8) under the name of *Pionandra* (now the *Cyphomandra* of Dr. Sendtner); but it differs from that genus in the form of its corolla, in its seeds, and its distinct habit. In this respect it also resembles the genus *Ectozoma*, which I have founded upon a plant from Peru, that has its stamens fixed in like manner, upon a free epipetalous ring. *Ectozoma*, however, has a corolla with an imbricate æstivation, and therefore belongs to the *Atropaceæ*, where it is placed in the tribe of

the *Solandreæ*, near *Juanulloa* (Ann. Nat. Hist. 2nd Ser. vol. iii. Ill. So. Am. Plants, vol. ii. pl. 53). The following is offered as an emended character of the genus from my observations upon the specimen above referred to.

TRIGUERA, *Cav.* Char. emend.—*Calyx* profunde 5-partitus, submembranaceus, persistens, laciniis subæqualibus, lanceolatis. *Corolla* campanulata, limbo 5-lobo obliquo, lobis inæqualibus, brevibus, obtusis, mucronulatis, superiori breviori reflexo, 2 inferioribus erectioribus, æstivatione induplicato-valvata. *Stamina* 5, inclusa; *filamenta* brevia, glabra, imo in urceolam mellifluam liberam annularem e basi corollæ ortam coalita; *antheræ* magnæ, conniventes, oblongæ, inferiori paulo minori, basi cordatæ, imo dorsi affixæ, 2-loculares, apice 2-cornutæ, introrsæ, loculis parallelis adnatis, primum poris geminis apicalibus, demum rimis longitudinalibus intus dehiscentibus. *Ovarium* subglobosum, 2-loculare, pauci-ovulatum, ovulis dissepimento placentifero utrinque adnatis. *Stylus* simplex, gracilis, persistens. *Stigma* parvum, obtusum, globoso-clavatum, cavum. *Bacca* sicca, 2-locularis, calyce aucto membranaceo suffulta, cortice membranaceo, dissepimento tenuissimo, subobliterato. *Semina* 4-6, magna, compressa, reniformia, hilo in sinu profundo laterale: *testa* favosa: *embryo* intra *albumen* carnosum spiraliter curvatus, teres, *radicula* ad angulum basalem spectante, hilo laterali evitante, *cotyledonibus* semiteretibus sublongiore.—Herbæ *Hispanicæ annuæ narcoticæ sæpe muscum redolentes*, folia *alterna*, *sessilia*, *subdecurrentia*, *obovata*, *sinuato-dentata*, *vel integra*; pedunculus *extra-axillaris*, 2-*fidus*, 2-*florus*, pedicelli *graciles*, *articulati*, *nutantes*, corolla *superne cærulescens*, *imo albescens*, *et radiis* 5 *albidis notata*.

1. *Triguera ambrosaica*, Cav. Diss. 2. App. 2. tab. A. Triguera baccata, *Gmelin*, *Syst.* vol. i. p. 338. Verbascum Osbeckii, *Linn. Sp.* pl. 255. *Rdb. Cent.* vol. v. tab. 17. fig. 52. *Tournef. Itin.* vol. ii. p. 83. *cum icon.*—Annua, caule sulcato, subalato, glabro; foliis radicalibus, integris, glabris, caulinisque obovatis, sessilibus, imo cuneato integro in angulis alatis decurrentibus, hinc grosse serratis, apice obtusiusculis, glauco-viridibus, utrinque glabris, margine ciliatis; pedunculo solitario, lateraliter sub-axillari, bifido, pedicellis e glandulis totidem cupuliformibus articulatis, calyceque dense lanato-pilosis; corolla purpureo-violacea, glabra, lobis rotundatis extus pilosis, urceolo staminifero brevi, ovarium dimidio includente.—Hispania, Prov. Andalusiæ.—*v. s. in herb. cl. Boissier.*

The plant appears to grow to the height of a foot, its herbaceous stem being erect and simple, rarely showing one or two lateral branchlets out of the axils. The leaves measure from $1\frac{1}{4}$ to $1\frac{3}{4}$ inch long, and 7 to 10 lines in breadth, the mid-rib and margins being decurrent on the angles of the leaf. A very short peduncle springs laterally from the point of insertion of the leaf, and exhibits two fleshy cupuliform glands, one a little above the other, and out of which arise the more slender pedicels, about five lines long, which are deflected; the calyx is four lines in length, and divided nearly to its base into somewhat acute segments, which in fruit grow to a length of six lines, and envelope the berry. The corolla, seven lines long, is campanular, somewhat oblique, the lobes of its border short and rounded, the two higher ones with the shorter stamen being exterior; the length of the perigynous ring is one line, the filaments half a line, and the erect anthers two lines, these burst in front, not only by nearly apical pores but by longitudinal fissures; the dorsal connective is extended beyond the anther cells, and appears like two short erect teeth. The berry forms a globular indehiscent capsule, quite devoid of pulp, the pericarp and dissepiment being very membranaceous, and about five lines in diameter. It contains four, generally six or eight seeds, which are very large in regard to the fruit; they are compressed, somewhat reniform, with a deep narrow sinus about the hilum, and are two lines in diameter; the testa is remarkably favose, the ridges being prominent and crenulated; the embryo, enveloped in albumen, is terete, somewhat spiral, with the point of the radicle directed towards the basal angle. The plant has the peculiar smell of musk.*

2. *Triguera inodora*, Cav. loc. cit. app. 3.—Planta tota glabra, foliis ovato-lanceolatis, integerrimis, marginibus vix decurrentibus, lævibus, pedunculo calyceque glabris; corolla pallide violacea, urceolo staminifero majore, ovarium totum includente.—Hispania, Prov. Andalusiæ.

This species is represented as being altogether glabrous, with a simple stem only six inches high, the leaves quite entire, and scarcely decurrent on the stem; the flowers are said to be larger and more handsome, with a somewhat shorter corolla; the whole plant is quite inodorous.

* A drawing of this species with sectional details will be given in a Supplementary Plate in vol. ii. Ill. So. Amer. Plants.

On the Genus Atropa ; *by* John Miers, Esq., F.R.S., F.L.S., &c.

Atropa.

On a former occasion I have alluded to the marked feature of the imbricate æstivation of the corolla in this genus, as a character quite incompatible with its position among the *Solanaceæ*, and have therefore arranged it along with several others in a distinct tribe, *Atropeæ*, (Ann. Nat. Hist. n. Ser.) forming one of many groups, which I have associated in a separate family or sub-order, whose peculiar features are there delineated. This genus has hitherto been so very indistinctly defined, and its limits so little understood, that it has served as a receptacle for many heterogeneous plants belonging to *Solanaceæ*, so that out of the numerous species placed in it by various authors, I can find only one remaining, the well-known *Atropa belladonna*. I have, however, met with, cultivated in our gardens, another species which, although indicated, has never before been fully described. In order to remove the confusion hitherto existing in this genus, I have collected together all the plants placed by botanists in *Atropa*, with a reference to the several genera to which they are now properly referrible. The following is offered as a more correct outline of the features of the genus, the details of which, with some few exceptions, are very faithfully delineated by Nees v. Esenb. Gen. Pl. Fl. Germ. (Gamopet. vol. i.) in his analysis of *Atropa belladonna*.

Atropa, (Char. emend.)—*Calyx* urceolato-campanulatus, 5-partitus, laciniis duplo-triplove tubo brevissimo longioribus, acutis, erectis, augescens, demum stellato-patens. *Corolla* infundibuliformi-campanulata, limbo brevi, 5-partito, laciniis oblongis, obtusis, æstivatione imbricatis. *Stamina* 5, æqualia, inclusa ; *filamenta* imo corollæ adnata, basi crassiuscula, fornicata, lanata, superne subulata, apice subito inflexa ; *antheræ* ovatæ, deflexæ, 2-lobæ, lobis parallelis, sine connectivo medio nexis. *Ovarium* ovatum, conicum, disco carnoso 4-lobo impositum, 2-loculare, placentis cum dissepimento cruciformibus mox lunatis incrassatis, ubique ovuligeris. *Stylus* filiformis, apice inflexus, et incrassatus. *Stigma* subglobosum, labiis 2 transversis compressis glandulosis signatum. *Bacca* globosa, 2-sulcata, 2-locularis, calyce patente suffulta. *Semina* plurima in pulpam nidulantia, reniformi-ovata, subcompressa, testa favoso-scrobiculata, hilo sublaterali.

Embryo teres, in albumen subcarnosum subspiraliter arcuatus, *radicula* angulam basilarem spectante, *cotyledonibus* semiteretibus sublongiore.—Herbæ *perennes* Europæ et Asiaticæ, *caulescentes*, foliis *geminatis*, *integerrimis*, pedunculis *extra-axillaribus*, *solitariis*, 1-*floris*, corolla *flavescente vel lurido-violacea*.

1. Atropa *belladonna*, Linn. Nees Gen. Fl. Germ. [icone optimo] :—caulibus erectis, dichotomis ; foliis geminatis, altero dimidio minore, late ovatis, versus apicem acuminatis, acutis, basi rotundatis et in petiolum longum repente cuneato-attenuatis, glaberrimis ; pedunculo pubescente, florifero pendulo, fructifero erecto, elongato, apice incrassato ; corolla lurido-violacea, filamentis imo sparse pubescentibus.—Europa.

The leaves of this plant are generally from five inches and a half to seven inches long, including the petiole, and three inches and a quarter broad.

2. Atropa *acuminata*, Royle. *Ill. Bot. Him.* 279. *Journ. Hort. Soc.* vol. i. p. 306. (n. sp.) :—caulibus erectis dichotomis ; foliis geminatis, altero tertio minore, oblongo-ellipticis, longe sensim acuminatis, imo in petiolum gradatim attenuatis, glaberrimis ; corolla majora, viridescenti-lutea, filamentis imo dense lanatis.—Mongolia. —*v. s. in Hb. Lindley* (Munro) *v. v. cult. in hort. Kewensi.*

In this very distinct and hitherto undescribed species, the corolla is considerably larger and broader, of a greenish yellow colour, and of thinner texture ; the filaments are densely cottony at their insertion. The leaves are seven inches long, including the petiole, and two inches and a quarter to two inches and three-quarters broad, they are very distinct in their form from that of the common *Belladonna*, being much narrower and very much tapered at both ends. It was introduced into this country from seeds sent from Chinese Tartary, by Captain Munro, in April, 1845, and the plants were first reared in the gardens of the Horticultural Society. The exact locality of its origin is not given, but it is stated to grow at a height of 12,000 feet.

I have little doubt that other species exist which have been confounded with our common *Belladonna*. The plants brought from the eastern extremity of Europe bordering upon Asia, appear to me intermediate between the two species above described, their leaves are more acuminated than those of our British plant, but the specimens I have

seen are too few and unsatisfactory to identify the specific points of difference. A specimen I have seen from Sicily also appears to me specifically distinct, but in the absence of more satisfactory materials, I do not attempt to say more on the subject.

The following is the list of excluded species, with their present references above alluded to :—

Atropa *viridiflora*, H.B.K.	..	Hebecladus *viridiflorus*, Nob.
—— *flexuosa*, Willd.	..	—— *idem*.
—— *umbellata*, R. & P.	..	—— *umbellatus*, Nob.
—— *revoluta*, Dietr.	..	—— *idem*.
—— *villosa*, Zeuch.	..	—— *idem*.
—— *biflora*, R. & P.	..	—— *biflorus*, Nob.
—— *erecta*, Hornem.	..	—— *idem*.
—— *bicolor*, R. & P.	..	—— *bicolor*, Nob.
—— *aspera*, R. & P.	..	—— *asperus*, Nob.
—— *glandulosa*, Hook.	..	Salpichroma *glandulosa*, Nob.
—— *dependens*, Hook.	..	—— *dependens*, Nob.
—— *hirsuta*, Mey.	..	—— *hirsuta*, Nob.
—— *rhomboidea*, Hook.	..	—— *rhomboidea*, Nob.
—— *spinosa*, Mey.	..	Lycioplesium *meyenianum*, Nob.
—— *arborea*, Willd.	..	Acnistus *arborescens*, Schl.
—— *arborescens*, Linn.	..	—— *idem*.
—— *frutescens*, Plum.	..	—— *Plumieri*, Nob.
—— *sideroxyloides*, Willd.	..	—— *sideroxyloides*, G. Don.
—— *arenaria*, Willd.	..	Nectouxia *formosa*, H.B.K.
—— *aristata*, Poir.	..	Withania *aristata* Pauq.
—— *erecta*, Zeuch,	..	—— *frutescens*, Pauq.
—— *frutescens*, Willd.	..	—— *idem*.
—— *biflora*, Pers,	..	Saracha *biflora*, R. & P.
—— *contorta*, Pers.	..	—— *contorta*, R. & P.
—— *dentata*, Pers.	..	—— *dentata*, R. & P.
—— *plicata*, Roth.	..	—— *procumbens*, R. & P.
—— *Rothii*, Poir.	..	—— *umbellata*, DC.
—— *umbellata*, Roth.	..	—— *idem*.
—— *mandragora*, Linn.	..	Mandragora *vernalis*, Bertol.
—— *idem*, Sibth.	..	—— *officinarum*, Bertol.
—— *origanifolia*, Desf.	..	Physalis *curassavica*, Linn.

Atropa *physaloides*, Linn.	..	Nicandra *physaloides*, Gaert.
——— *punctata*, Pers.	..	Pœcilochroma *punctata*, Nob.
——— *Solanacea*, Linn.	..	Solanum *aggregatum*, Jacq.
——— *hirtella*, Spr.	..	——— *gracillimum*, Sendt.
——— *herbacea*, Mill.	..	Ignota.

On the genus WITHANIA; *by* JOHN MIERS, Esq., F.R.S., F.L.S., &c.

WITHANIA.

This genus differs from *Physalis* in its fruticose habit, in its urceolate calyx, with long setiform teeth, enlarging with the growth of the fruit into a campanular shape, with a wide, open mouth, and becoming coriaceous in substance, not resolving itself into a globular bladder-like form, of thin reticulated texture, and concealing the berry. The corolla also differs in having a short funnel-shaped tube, somewhat longer than the tube of the calyx, with a border of nearly equal length, divided into five linear erect teeth, with obtuse summits, the stamens dilated at base and originating in a nearly annular adnate ring, the stigma is large and capitate, or rather sub-bilabiate, with a large two-lobed gland enclosed between the two rounded lobes. The embryo is helical and spiral, consisting of a whorl and a quarter. It approaches *Hypnoticum* and *Puneera* in the form of its corolla, but it differs from them in the structure and growth of its calyx.

WITHANIA, *Pauq.* (Char. Emend.) — *Calyx* urceolato-campanulatus, dentibus 5 longe setiformibus, demum auctus. *Corolla* breviter infundibuliformis, limbo 5-fido, laciniis linearibus, expansis, obtusis, tubo æquilongis, æstivatione valvata. *Stamina* 5, æqualia, corollæ tubo brevioria, *filamenta* membranacea imo valde dilatata, in annulum sese fere attingentia et imo tubi adnata; *antheræ* oblongæ, cordatæ, acutæ, apicifixæ, 2-lobæ, lobis parallele connatis, longitudinaliter intus dehiscentibus. *Ovarium* oblongum, 2-loculare, placentis dissepimento utrinque adnatis, multiovulatis. *Stylus* simplex. *Stigma* capitato-bilobum. *Bacca* 2-locularis, calyce aucto coriaceo campanulato ore expanso inclusa. *Semina* pauca, pro mole magna, reniformia *Embryo* intra albumen carnosum spiralis, teres, cotyledonibus semiteretibus, radicula infera ad angulum basalem spectante brevioribus.

—Frutices *Hispanici, Algerienses et Canarienses*, foliis *alternis v. geminis, ovatis, aut oblongis, obtusis*, floribus *paucis, extra-axillaribus.*

1. ***Withania frutescens***, Pauq. *Dissert. Bellad.* Atropa frutescens, *Linn. Sp.* pl. 200. Physalis frutescens, *DC. Flor. Fr.* vol. iii. p. 611. Hypnoticum frutescens, *Rodr.* Physalis tuberosa, *Cav. Icon.* vol. ii. tab. 102. — fruticosa, foliis ovatis sub-cordatis, sparse pubescentibus aut glabris, margine petioloque ciliatis; floribus 1–3, aggregatis, pedicellatis sub-extra-axillaribus — Hispania et Algeria.

The leaves in the specimens I have seen from Oran, are nearly circular, subcordate, somewhat emarginate at the apex, and nearly $1\frac{1}{2}$ inch in diameter, on a slender canaliculate petiole half an inch long. The specimens from Spain have smaller and more ovate leaves. The berry is small, barely $2\frac{1}{2}$ lines in diameter, with only a single seed perfected in each cell: it is enclosed in the campanular calyx with five expanding lobes, a wide open mouth, and of double its length and diameter: the seed is compressed reniform, about two lines in diameter. The lobes of the persistent calyx are rounded, coriaceous, and with the setiform apical termination often withered.

2. *Withania aristata*, Pauq. (*loc. cit*)—Atropa aristata, *Poir.* Physalis aristata, *Ait*: fruticosa, ramis compressis, angulatis; foliis oblongis vel rotundatis, subcordatis, apice obtusis, retusis, utrinque glabrescentibus, margine petioloque canaliculato ciliatis; floribus solitariis sub-extra-axillaribus, pedunculis lanatis.––Insul. Canariensibus.

The berry in this species is globular, about half an inch in diameter, encloses many seeds, and is tightly invested by the persistent calyx of equal length, which is almost entire, or at least, with five very short teeth, terminated by five setiform threads nearly equal in length to the calycine tube. The hairs seen in this and the foregoing species, are brachiate as in *Physalis* and *Hypnoticum*.

Hyoscyamus.

I am induced to offer a few remarks, and propose an emended character for this genus, in order to confirm some observations made on a previous occasion (*huj. oper.* i. 174). Although the opercular dehiscence of the capsule of *Hyoscyamus* has long been notorious, the fact of a glandular enlargement on the summit of the ovarium does not appear to have been anywhere described: it is however a circumstance worthy of consideration in a physiological point of view, and leads us to inquire what is its true nature. In the ovarium of *Hyoscyamus pictus*, which I examined in a living state, this glandular appendage is seen to form a very distinct, thick, and fleshy covering over its larger superior moiety, where it is terminated by a decided margin, and as the ovarium advances towards maturity, the lower portion increases considerably in bulk, the pericarpial envelope being drawn out to a thin membranaceous tube, marked with numerous longitudinal and branching nervures, while the upper thickened moiety increases but little in length: these longitudinal nervures may be distinctly traced upon the inner lining from the base to the summit of the cell, while upon the external face they are visible only on the lower portion, no trace of them being seen upon the glandular moiety, which exhibits quite a different texture, proving beyond all doubt that the glandular coating in question is really superimposed, and forms no part of the endocarpial lining, and therefore that it is not an interior secretion within the cavity of the cell. It is evident that the lower half of the ovarium consists of two cohering integuments with little or no intervening substance; for when the fruit is ripe they are seen to be really distinct, and may without difficulty be separated from each other on their lacerated edges: but in the upper moiety the remarkable fleshy gland before mentioned is seen to be interposed between the continuation of these two integuments, and as it hardens by the deposition of woody matter it constitutes the well-known operculum, which forms quite an external mushroom-headed enlargement, and which falls off, not by a regular dehiscence, but by a ruptured edge, as is proved by the lacerated margin of the two integuments upon the circumscissile line. The nature and purport of this apical gland do not appear manifest; it is probably an extension from the base of the style, for the epicarpial integument terminates at the summit of the ovarium by a small ring, that forms an apparent articulation with the style, which on the contrary is continuous with the gland in question, this being evident upon making a longitudinal section just before the ripening of the fruit.

Dr. Putterlick has given in Nees's 'Gen. Pl. Germ.' a very good series of illustrated analytical dissections of the flower and seed

of *Hyoscyamus*, but in many respects these details do not agree with the structure, as I have observed it; for instance, the placentæ are represented as being cruciform with the dissepiments, to which they are attached by a central axile line, becoming lunately expanded in the middle of each cell as in *Physalis*; I have found the placentæ on the contrary to be thick and fleshy, both closely adnate with the dissepiment, forming one cylindrical column that fills the greater portion of the central space of the ovarium; the embryo is also shown too thick in proportion, and the cotyledons are not incumbent as there exhibited, but accumbent after the manner almost universally seen in this family: some of the figures there truly represent the corolla as having an imbricated æstivation, which however is erroneously described in the text, as in the descriptions of all other authors, as being plicated: there is no indication there represented of the remarkable apical gland in the summit of the ovarium.

I have annexed the specific character of a species which I found growing in Kew Gardens, and which appears nowhere given.

Hyoscyamus, Tournef.—*Calyx* urceolato-tubulosus, 10-nervis, 5-dentatus, dentibus erectis demum rigidis, persistens et augescens. *Corolla* infundibuliformi-campanulata, obliqua, imo constricta, limbi obliqui lobis 5, brevibus, obtusiusculis, subinæqualibus, patentibus, sæpe hinc semi-fissa, æstivatione imbricata. *Stamina* 5, imo corollæ inserta, inclusa, rarius exserta, declinata; *filamenta* imo fornicata et puberula, superne subulata et glabra; *antheræ* 2-loculares, loculis arcte adnatis, longitudinaliter intus dehiscentibus, imo connectivi dorsalis articulatim affixæ. *Ovarium* conicum, disco hypogyno fere obsoleto impositum, glandula apicali magna crasso-carnosa signatum, 2-loculare, pluri-ovulatum, placentis valde incrassatis dissepimento utrinque adnatis. *Stylus* exsertus, apice incurvus. *Stigma* capitato-bilobum. *Capsula* urceolata, submembranacea, calyce aucto reticulato-coriaceo dentibus pungentibus recondita, 2-locularis, supra medium horizontaliter ruptilis, operculo deciduo, cupuliformi, crasso, corneo. *Semina* reniformi-ovata, compressa, *testa* scrobiculata, *hilo* prominulo cavo in sinu laterali. *Embryo* in *albumen* carnosum teres, subspiralis, *radicula* paulo incurvata, ad angulum basalem spectante, *cotyledonibus* semiteretibus æquilonga.—Herbæ *Gerontogeæ pubescentes, sæpius viscosæ et olidæ*, radice *perennante*; folia *alterna, dentata, vel sinuato-angulata, floralibus sæpe geminis*; flores *axillares, solitarii, secundi*; corolla *lutescens, sæpe reticulatim picta**.

* Analytical details of this genus will be given in a supplementary plate at the end of this volume.

Hyoscyamus pictus, Bernh. MSS.;—viscido-pilosus, foliis ellipticis, acutis, sub-3-lobis, infra medium sæpe repandis, vel sinuatis, subamplexicaulibus, rachi, nervis, margineque lanato-pilosis; flore breviter pedunculato, caule, pedunculo, calyceque pungente imo ventricoso lanato-pilosis, corolla ventricosa, glabra, sulphurea, venis violaceis reticulatim picta, ad ventrem subfissa, intus imo maculis magnis 5 violaceis ornata, limbi lobis subæqualibus obtusis, filamentis luteis, antheris violaceis inclusis.—*v. v. cult.*

Physochlæna.

The plants composing this small group were for a long time considered as species of *Hyoscyamus*. Mr. G. Don (Dict. iv. 470) was the first to separate them as a distinct genus, on account of their entire leaves and their terminal corymbose purple flowers, but as in his generic character no feature appeared to indicate any difference from *Hyoscyamus*, either in the structure of the flower or the fruit, they have been retained in this latter genus by all succeeding botanists. M. Decaisne in describing an Indian species perceived the difference of its habit from that of *Hyoscyamus*, and adopted it as the type of a new genus, under the name of *Belenia*, but this suggestion has in like manner been disregarded. I have noticed however the following circumstances that seem to warrant the restoration of this genus. In *Physochlæna* the apical gland is proportionally much smaller and far less conspicuous than in *Hyoscyamus*, for the ovarium being more conical, it covers only the extreme upper portion beneath the base of the style, and is distinguishable from the rest of its surface by its lurid purple colour: it offers also a larger and more conspicuous hypogynous, fleshy, yellow disc, which is sometimes scarcely discernible in the other genus. Besides these points of variance, and the dissimilarity in habit, as well as in the colour of its corolla, the following differences are evident. In *Hyoscyamus* the flowers are always axillary, nearly sessile at the base of a large leaf, and generally secund; the calyx increases very considerably in length, becomes stiff and rigid, and its teeth, conspicuous for their strong marginal nerves, ending in a long mucronate point, become hard and spiculate, and are always somewhat spreading; the operculum is convex, nearly hemispherical, and of a bony consistence. In *Physochlæna*, on the contrary, the flowers are never axillary, but always upon a more or less lengthened terminal raceme or panicle; the calyx does not increase to half the size, in proportion to that of *Hyoscyamus*, it is more reticulated, of thinner and more membranaceous texture, and the teeth, wanting the strong marginal nervures, are thin and blunted, and generally inflexed, nearly closing the mouth of the tube; the

operculum is also much smaller, quite flat and discoid, and less bony in its substance. These different features are fully sufficient to constitute a valid genus, which I propose to call *Physochlæna*, a name more strictly in conformity with the usual orthoëpy than that of Don, being derived from *φῦσα, vesica, χλαινόω, vestio,* because of its capsule inclosed in a vesicular calyx. I here annex its generic outline :—

Physochlæna. Physoclaina, *G. Don.* Belenia, *Decne.*—*Calyx* cylindricus, sæpe medio subinflatus, 10-nervis, 5-dentatus, persistens et augescens. *Corolla* campanulato-infundibuliformis, superne ventricosa, imo constricta et cylindrica, limbo vix obliquo, subæqualiter 5-fido, lobis subacutis, haud patentibus, æstivatione imbricata. *Stamina* 5, subæqualia, declinata, sæpius exserta, in constrictionem corollæ inserta, *filamenta* ortu pilosa, superne glabra, colorata ; *antheræ* ovatæ, imo dorsi ad connectivum articulatim affixæ, 2-loculares, loculis adnatis, margine longitudinaliter dehiscentibus. *Ovarium* conicum, disco carnoso annulari basi cinctum, glandula parva apicali vix conspicua munitum, 2-loculare, ovulis plurimis, placentis valde incrassatis, dissepimento utrinque adnatis. *Stylus* incurvus, exsertus. *Stigma* subbilobo-capitatum. *Capsula* turbinata, membranacea, calyce reticulato inclusa, 2-locularis, apice operculatim dehiscens, operculo parvo discoideo, coriaceo. *Semina* plurima, placentis crassis affixa, ovata, compressa, reniformia, *testa* reticulato-favosa, *hilo* laterali. *Embryo* teres, intra *albumen* subcarnosum hemicyclicus, *radicula* incurvata, ad angulum basalem spectante, cotyledonibus semiteretibus æquilongis.—Herbæ *Gerontogeæ Orientales,* radice *perennante,* caulibus *plurimis* ; folia *elliptica, alterna, integra, petiolata* ; flores *terminales, corymbosi, pedicellati* ; corolla *purpurascens, rarius sublutescens.*

1. *Physochlæna physaloides.* Physoclaina physaloides, *G. Don, Dict.* iv. 470. Hyoscyamus physaloides, *Linn. Amœn. Acad.* vii. tab. 6. fig. 1 ; *Sims, Bot. Mag.* tab. 852 ; *Sweet, Br. Fl. Gard.* i. tab. 13 ;—radice tuberoso, caulibus plurimis erectis, simplicibus ; foliis subcordato-ovatis, acutis, imo in petiolum canaliculatum æquilongum attenuatis, utrinque glaberrimis, margine ciliatis ; panicula terminali, pedicellis calycibusque dense lanato-pilosis ; corolla omnino glabra, purpurascente, laciniis obtusis, albescentibus, genitalibus faucem vix excedentibus ; calyce fructifero inflato, glabro, capsulam dimidio minorem claudente.—Siberia, in montibus Altaicis, et planitiis Songariæ.—*v. s. in herb. Hook. e locis citatis.*

This plant scarcely exceeds the height of 6 or 8 inches, and

may at once be distinguished from all others by the smallness of its leaves, and of its stature and its tuberose root: its leaves are $\frac{3}{4}$ inch long and 7 lines broad; they are subcordate or auriculate at base, tapering suddenly, and decurrent on the petiole of equal length. The flowers are capitato-corymbose; the pedicels and calyx are clothed with long cottony hairs, which are articulated, but apparently not viscous; the calyx is 3 lines long, the corolla 6 lines, the former growing to a length of 8 lines, being 3 lines broad in the mouth, and 5 lines diameter in the swollen middle; it is of transparent texture, smooth, marked with numerous reticulations, and with ten longitudinal nervures; the berry is about 3 lines in diameter, subglobose, with a small flattened operculum.

2. *Physochlæna Dahurica*;—caule violascente, foliis deltoideo-ovatis, acutis, basi auriculato-cordatis, hinc subito acuminatis, et in petiolum crassum decurrentibus, rachi venisque purpurascentibus, utrinque glaberrimis; panicula terminali, lanato-pilosa, genitalibus inclusis.—Dahuria, *v. s. in herb. Hook.* (Hyoscyamus physaloides, *Turczaninow*).

This plant differs from the preceding in its more fleshy habit, its leaves being much larger, more deltoid, more acute at the apex, broader at their base; they are $1\frac{3}{8}$ inch long, $1\frac{3}{8}$ inch broad, on a fleshy petiole $1\frac{1}{2}$ inch long.

3. *Physochlæna rubricaulis.* Hyoscyamus physaloides, *Sweet, Brit. Fl. Gard.* i. tab. 12;—caulibus crassis, subprostratis, subflexuosis, rubescentibus, nodis cupularibus cum petiolo articulatis; foliis oblongo-ovatis, acutis, repando-undulatis, basi obtusis, in petiolum crassum canaliculatum longe decurrentibus, utrinque glaberrimis; racemo corymboso, terminali rufescente, paucifloro, pedicellis incurvis, calycibusque fuscis dense glanduloso-pilosis, corolla glabra, purpurascente, laciniis ovatis, rotundatis, staminibus inclusis, stylo declinato exserto recurvo.—*v. s. in hort. Kew. cult.*

This plant has a fusiform root: its stems are fleshy, somewhat flexuose, with internodes seldom more than half an inch apart; its leaves in shape much resemble those of *P. Dahurica*; they are 2 inches long, $1\frac{1}{4}$ inch broad, gradually tapering upon a fleshy petiole $1\frac{1}{2}$ inch in length; this as well as the thick fleshy midrib and prominent nerves are of a dark reddish purple colour; in drying, the blade of the leaf becomes yellow. Its inflorescence is much shorter, fewer-flowered, and covered with dense short viscous down, not long woolly hairs, and its flowers are not corymbose and many-flowered. The calyx is 4 lines long, 2 lines in diameter; the corolla is 7 lines long, of a reddish purple colour, and its lobes are more ovate and rounded; the ovarium is gla-

brous. It makes its appearance at least a month or six weeks later in the season than the two following species *.

4. *Physochlæna orientalis*. Physoclaina orientalis, *G. Don, loc. cit.* Hyoscyamus orientalis, *Bieb. Fl. Taur.* i. 164; *Sims, Bot. Mag.* tab. 2414;—viscoso-pubescens, foliis fusco-viridibus, deltoideo-ovatis, acutis, in petiolum sublongum attenuatis, demum subglabris; floribus corymbosis, corolla obscuriore, purpurea, staminibus atro-violaceis, styloque æquilongo longe exsertis, calyce florifero tubuloso, fructifero cylindrico, membranaceo, reticulato, capsulam minorem includente.—Caucasia prope Narzanam: *v. s. in herb. Hook.* (Caucasus, *Steven*) *et in hort. Kew. cult.*

This plant grows in the open air in Kew Gardens to the height of 12 or 18 inches, its numerous stems being annually deciduous: it is altogether covered with short viscous pubescence, which, as well as the foliage, is of a dark fuscous hue, becoming greener after the fall of the flowers. The leaves are $2\frac{1}{2}$ inches long, $1\frac{1}{4}$ inch broad, upon a fleshy channeled petiole of 1 inch in length, the nervures and stem being of a purplish hue: the calyx is 3 lines long, the corolla 6 lines, the stamens and style being exserted to a length of 3 lines: the capsule is 3 lines in diameter, inclosed in the calyx of equal diameter, and of nearly double its length, which is pilose, reticulate, submembranaceous, and in no degree swelling in the middle: the lower valve of the capsule is somewhat membranaceous, greenish, and marked with several longitudinal nervures; the operculum, crowned by the persistent base of the style, is of a blackish violet hue, soft, of thin texture, and quickly shrivels up in drying: the seeds are few, proportionately rather large, yellowish brown, scrobiculated, oval, reniform and compressed: the embryo is arched in a semicircular form; the radicle, about the length of the cotyledons, points to the basal angle below the lateral hilum.

Var. *β. affinis*. Hyoscyamus orientalis, *Sweet, Brit. Fl. Gard.* i. tab. 12;—glanduloso-pubescens, foliis ovatis, acutis, in petiolum sublongum attenuatis, venis pilosulis, demum subglabris; corolla purpurascente, lobis subalbidis, staminibus inclusis, stylo longe exserto, calyce fructifero inflato.—*v. v. cult. in hort. Kew.*

This plant grows by the side of the former species, and little or no difference is to be seen between them in the size and shape of the leaves: they are however less fuscous, and do not become so thick and dark in drying, the pubescence is less dense, and the

* A drawing of this species with analytical details will be given in a supplementary plate at the end of this volume.

nervures beneath are prominent and green. The inflorescence is panicular, not corymbose; the pedicel, as well as its small sessile ovate pointed bract, and the calyx, being covered with dense, short, patent, glandular hairs: the corolla, of a pale purplish colour, is slightly pubescent externally; its æstivation is distinctly imbricate, with its external lobe on the contrary side to the more oblique portion, to which the stamens and style are inclined; the ovarium exhibits several long simple hairs upon its surface.

5. *Physochlæna prælta.* Belenia prælta, *Decne. Jacq. Voy. Bot.* 114. tab. 120. Hyoscyamus prælatus, *Walp. Rep.* iii. 21;—herba perennis, pilis brevibus rarisque viscidulis tota inspersa, foliis e parte infra medium lanceolatis, imo deltoideis. subiter acuminatis, et in petiolum incrassatum decurrentibus, supra glabris, subtus rachi crassissimo, et in venis prominentibus viscidulo-pilosis; panicula terminali, elongata, ramosa, ramis longis, laxiflora, pedicellis calyce longioribus, bracteatis, cernuis, demum elongatis, erectis; calyce brevi, urceolato, dentibus 5 brevibus reflexis, fructifero valde aucto, et subincurvo: corolla viridi-lutescente, venis viridibus picta.—Himalaya.

This plant appears much taller than any of the foregoing species, its inflorescence much longer and more lax, the calyx grows to a larger size considerably, and the corolla is of a greenish yellow, marked with dark green reticulations, as in *Hyoscyamus*. It approaches *Hyoscyamus muticus*, which probably belongs rather to this genus, on account of its long, panicular, terminal inflorescence, the obtuse lobes of its calyx, and often purple flowers. The leaves are $3\frac{3}{4}$ inches long (exclusive of its decurrent petiole of $\frac{1}{2}$ an inch), and $1\frac{1}{2}$ inch broad. The inflorescence is 7 or 8 inches long; the corolla is more campanular than that of the typical species, the stamens being included; the style alone is exserted: the calyx in flower is 4 lines long, tubular, and 2 lines in diameter; it subsequently grows to a length of 11 lines and to a diameter of 4 lines. In the drawing above quoted, a section is given of the seed of this species, in which there appears a manifest error in the relative positions of the radicle and cotyledons in regard to the hilum: it seems very unlikely that it should differ in this respect from the features described in the generic character, which are derived from careful observation upon several other species, and which are conformable to the structure known to exist in all the allied genera in this family.

Scopolia.

A single species only of this genus is recorded, and it seems to possess a considerable range, for it is found in Illyria, Croatia,

and the southern portions of Hungary: although thus frequent, it cannot have attracted the notice of botanists, for I have not been able to find in any herbarium, sufficiently satisfactory specimens from which a careful analysis of its characters could be made. A small plant raised in Kew Gardens has, however, afforded the means of examining its flower in a living state, but I was disappointed in watching the development of its fruit, as it seems to require a more genial climate than ours, at the early season in which it appears, to perfect its capsule: every search in different herbaria for a specimen of its fruit has proved unsuccessful. A very good analysis of the genus is seen in Nees's 'Gen. Pl. Germ.,' but this does not explain the structural formation of its fruit. I have pointed out the existence of the curious apical gland covering the upper moiety of the ovarium in *Hyoscyamus*, as the cause of the transverse opening of its capsule; that of *Physochlæna* appears to originate from a similar cause, only in a more modified degree. In *Scopolia* there is seen a slight thickening of the upper portion of the ovarium, as in the last-mentioned genera, and at the same time it is supported by a thick fleshy basal gland as in *Physochlæna*. In *Hyoscyamus* the operculum is hard, thick, osseous and hemispherical; in *Physochlæna* it is flat and discoid: it remains to be seen therefore in what state this exists in *Scopolia*. From the indications offered by dried specimens farther advanced towards maturity than the living flowers above alluded to, it appears to resemble the structure of the last-mentioned genus. Unable to examine the fruit of *Scopolia*, I have copied, in the following generic outline, the characters of the capsule and seed, entirely from Nees's description and figure above quoted.

Scopolia, Jacq. (char. emend.).—*Calyx* turbinato-campanulatus breviter 5-dentatus, persistens. *Corolla* infundibuliformi-campanulata, 15-nervis, limbi fere integri lobis 5, brevissimis, obtusiusculis, æqualibus, æstivatione tubo subplicato, lobis imbricatim dispositis. *Stamina* 5, æqualia, inclusa, imo tubi orta; *filamenta* brevia, basi dilatata et pilosula, superne teretia, glabra; *antheræ* ovatæ, connectivo dorsali articulatim affixæ, imo cordatæ, 2-loculares, loculis adnatis, rima marginali dehiscentibus. *Ovarium* conicum, disco carnoso 5-lobo basi cinctum, 2-loculare, ovulis plurimis, placentis valde incrassatis dissepimento utrinque adnatis. *Stylus* erectus, longitudine staminum. *Stigma* capitatum, obsolete bilobum. *Capsula* subgloboso-turbinata, coriacea, calyce membranaceo persistente inclusa, 2-locularis, apice operculatim dehiscens. *Semina* plurima, placentis crassis affixa, ovoidea, reniformia, *testa* granulosa, hilo laterali. *Embryo* teres, intra albumen subcarno

sum hamato-arcuatus, *radicula* paulo incurvata, ad angulum basalem spectante, cotyledonibus hemicyclicis semiteretibus æquilonga.—Herba *in Europæ orientalis alpinis indigena, glaberrima,* radice *perennante*; folia *gemina, altero minori, elliptica, acuta, in petiolum longum attenuata*; flores *solitarii, longe pedunculati, penduli, inter foliorum paria orti*; corolla *luride aurantiaco-purpurea.*

1. *Scopolia carnoliaca,* Jacq. Observ. i. 32. tab. 20. Scopolina atropoides, *Schult. Æstr. Fl.* i. 844. Hyoscyamus Scopolia, *Linn. Mant.* pl. 46; *St. Hil. Fl. Fr.* 20. tab. 6; *Bot. Mag.* tab. 126; *Nees, Gen. Pl. Germ.* cum icone;—foliis oblongis, acuminatis, basi attenuatis et in petiolum longum crassum decurrentibus, inferioribus alternis, caulinis geminis, rarius 3-nis, flore solitario pendulo. In sylvis Illyriæ et Hungariæ.

Anisodus.

In noticing this genus (*huj. oper.* vol. i. p. 166), I had arranged it near *Atropa,* on account of the analogy offered by the structure of the corolla in that genus, and of the apparently fleshy pericarpial covering of its immature fruit; since that period I have had an opportunity of examining its ripened capsule, and now find that it must take its place among the *Hyoscyameæ,* after *Thinogeton,* and thus bordering upon *Atropa.* The ovarium is small, conical, and half invested below by a very thick fleshy yellow disc; its apical gland, in the young state, is not so strongly developed as in *Hyoscyamus,* though it is distinctly visible, and may be considered, in like manner, as an extension of the base of the style: as the process of fructification advances, the basal disc disappears, and the lower portion of the ovarium takes a rapid increment both in length and diameter, and the pericarpial covering becomes more and more attenuated, until at length it forms a thin and brittle shell, composed of a loosely cohering epicarpial and an endocarpial pellicular integument with a thin semiligneous mesocarpial intervening plate: the opercular apex is smaller, in proportion, than in *Hyoscyamus,* flatter, thick and coriaceous, somewhat 4-lobed, and bursts away from the lower shell by a ruptured circumscissile line of dehiscence, as in the genus last mentioned. The border of the corolla is not plicate, as stated by Endlicher and other authors, but on the contrary, distinctly imbricate in æstivation. The following may be considered as an outline of its generic features.

Anisodus, Link. (Char. reform.)—*Calyx* magnus, tubulosus, infra medium subinflatus, 10-costatus, 5-dentatus, dentibus brevibus, inæqualibus, obtusis, persistens, in fructu non au-

gescens. *Corolla* campanulato-tubulosa, imo contracta, medio inflata, tubo carnosulo calycis longitudine, limbo brevi 5-partito, lobis rotundatis, reflexis, tenuioribus, uno majusculo in alabastro interiore, æstivatione omnino imbricativa. *Stamina* 5, æqualia, inclusa, erecta; *filamenta* teretia, basi dilatata, imo tubi inserta, in alabastro pubescentia, demum glabra; *antheræ* oblongæ, imo cordatæ, sinu apicifixæ, 2-loculares, loculis parallele connatis, intus longitudinaliter dehiscentibus. *Ovarium* conicum, imo disco magno carnoso plurisulcato circumdatum, 2-loculare, placentis valde incrassatis, pluri-ovulatis, dissepimento utrinque adnatis. *Stylus* teres, longitudine staminum. *Stigma* clavato-bilobum, subcompressum. *Capsula* ovata, subcoriacea, fragilis, 2-locularis, calyce reticulato 10-costato recondita, apice horizontaliter ruptilis, operculo deciduo, subplano, sub-4-lobo, crasso-coriaceo. *Semina* plurima, reniformia, compressa, *testa* leviter punctulata. *Embryo* intra *albumen* carnosum hamato-arcuatus, teres, *radicula* paulo curvata, angulo basali spectante, *cotyledonibus* semiteretibus uncatis æquilonga.—Herba *Nepalensis*, radice *perennante*, folia *oblonga*, *geminata*, *altero minori*, *petiolata*; flores *solitarii*, *axillares*, *nutantes*.

1. *Anisodus luridus*, Link, Icon. Select. Pl. Ber. 77; Nees, Linn. Trans. xvii. 72. Nicandra anomala, *Link & Otto, loc. cit.* tab. 35. Whitleya stramonifolia, *Sweet, Brit. Fl. Gard.* ii. tab. 125. Physalis stramonifolia, *Wall. Cat.* 2632 *et in Roxb. Fl. Ind.* ii. 242;—herba elata, dichotome ramosa; foliis oblongis, utrinque acutis, basi subinæqualibus, supra glabris, subtus flavidis, floccoso-tomentosis, petiolo crassiusculo; flore nutante, pedunculo pubescente, petioli longitudine, calycis tubo 10-angulato, angulis costatis, pilis articulatis pubescentibus; corolla viridi-lutea, demum lurido-purpurascente.—Nepal, *v. s. in herb. Wall., in herb. Hook., et v. v. in hort. Kew. cult.*

This plant is cultivated in the Kew Gardens, where it assumes a shrubby appearance, about 5 or 6 feet high, with large and copious foliage: its stems are annual, appearing each spring from its large perennial root. The leaves are about 7 inches long and $3\frac{1}{2}$ inches broad, on a fleshy channeled petiole of about 1 inch in length, the geminate leaf being about half that size. The peduncle also, 1 inch long, springs from the interval between the two petioles. The calyx is somewhat fleshy in texture, subangular, with ten prominent pubescent nervures, and with intermediate reticulations; it is campanular below, broadly tubular and somewhat cylindrical above, about 1 inch in length and nearly an inch in diameter, being surmounted by five broad triangular teeth of unequal size, and from 1 to 4 lines in length.

The corolla is of fleshy texture, about an inch long, 9 lines in diameter at the mouth, and somewhat broader in the middle, being contracted at the base to a diameter of 4 lines; it is smooth outside and woolly within; the lobes of the border are quite glabrous, nearly round, and reflexed, the margins overlapping each other; they are of much thinner texture, and in æstivation the larger lobe is altogether interior, the adjoining one being generally exterior, while the intermediate lobes are convolutely imbricated; the filaments are quite erect, 9 lines long, terete above, much flattened below, and inserted in the contracted base of the tube; they are pubescent in bud, quite smooth after the flower opens, the anthers being 3 lines long and $1\frac{1}{2}$ line broad. The ovarium is 4 lines long, conical, 3 lines broad at base, where it is encircled by a large yellow fleshy 10-grooved disc, 4 or 5 lines in diameter. The capsule is oval, smooth, somewhat stipitate upon the withered disc, is 10 lines long, 7 lines in diameter, with a coriaceous operculum and a large fleshy coriaceous honeycombed receptacle bearing many flattened reniform seeds, of about a line in diameter. The ten nerves of the persistent calyx become thickened, hard, and woody, the intermediate portion of the tube being dried and reticulated, almost cancellately so. I observed that the style falls away on the withering of the corolla, and is not mucronately persistent on the berry, as stated by Nees and Endlicher. I noticed also in the living flower the constant character of two or three processes at irregular distances, white, fleshy, compressed, linear, pointed, and two or three lines long, between the calyx and corolla, and originating apparently from the base of the former. I have not been able to meet with any native specimen of this plant by which to ascertain whether this be as constant a feature as that observed in a cultivated state*.

Mandragora.

This genus, though differing widely from *Atropa* in habit, greatly resembles it in the form of its calyx and corolla, and the structure of its fruit: as in *Atropa*, the lobes of its corolla possess an imbricated æstivation. The following is an amended generic character:—

Mandragora, Tournef. (Char. emend.).—*Calyx* urceolato-tubulosus, 5-angularis, laciniis 5, lineari-acutis, nervo prominulo notatis, erectis, tubo fere duplo longioribus, in fructu augescens et persistens. *Corolla* infundibuliformis, limbo 5-partito, laciniis subrotundatis, expansis, æstivatione imbricatis. *Stamina* 5, sub-æqualia, inclusa; *filamenta* infra medium corollæ

* Full generic details of this genus are shown in a supplementary plate at the end of this volume.

inserta, imo fornicata, crassiora et pubescentia, superne filiformia, glabra; *antheræ* erectæ, oblongæ, cordatæ, apice attenuatæ, connectivo dorsali imo affixæ, 2-lobæ, lobis parallele adnatis, antice rima longitudinali dehiscentibus. *Ovarium* ovatum, disco parvo carnoso lobulis 2 prominentibus dissepimento oppositis insitum, 2-loculare, placentis valde incrassatis dissepimento utrinque adnatis, multi-ovulatis. *Stylus* filiformis, apice inflexus. *Stigma* clavato-bilobum. *Bacca* magna, calyce aucto membranaceo suffulta, 2-locularis. *Semina* plurima in pulpam nidulantia, reniformia. *Embryo* teres, in albumen carnosum hemicyclico-arcuatus, *cotyledonibus* semiteretibus, *radicula* angulo basali spectante fere duplo longioribus. —Herbæ *perennes in Europa Australi indigenæ, acaules,* radice *crassa, carnosa,* folia *radicalia, conferta, petiolata, basi attenuata, integerrima, undulata*; pedunculi *radicales, conferti, uniflori, apice incrassati.*

1. *Mandragora officinalis,* Linn., Flor. Græc. tab. 232; Walpers, Rep. iii. 104.
2. *Mandragora vernalis,* Bertol., Com. Bonon. ii. 388. tab. 23; Gærtn. ii. 236. tab. 131; Walp. id. 105.
3. *Mandragora præcox,* Sweet, Brit. Fl. Gard. ii. tab. 198; Walp. id. 105.
4. *Mandragora microcarpa,* Bertol., Com. Bonon. ii. 391. tab. 25; Walp. id. 105.

The above generic character is formed in great measure from a plant I had an opportunity of examining in its living state, probably *M. microcarpa.* Its leaves are numerous, spreading, all radical, lanceolate, acuminated at both ends, and decurrent on a thick fleshy purplish petiole; they are undulated and somewhat sinuous on the crenulato-dentate margin, rough on both sides, with several small tubercles bearing minute articulated hairs; the very fleshy broad midrib, and about seven pairs of prominent pinnate nerves, with intermediate reticulated veins, are clothed with rather short articulated pubescence; they are about 10 inches long, exclusive of a petiole of 2 inches, and 3 inches broad. Several peduncles spring from the base of the petioles; they are erect, pubescent, thickened above, about $1\frac{1}{2}$ inch long and 1-flowered. The calyx consists of a short campanular tube 2 lines long, with five equal narrow linear acuminated erect segments, each 4 lines long; the corolla is tubular, somewhat funnel-shaped, about 6 lines in length, and 4 lines in diameter in the mouth; the lobes of the somewhat oblique border are oblong, overlapped at base, tapering and obtuse at their summit, of a pale blue or lilac colour, each marked with three parallel nervures and numerous anastomosing veins, and are slightly ex-

panded. The stamens are equal, hairy and slightly arched at their origin, slender, smooth, and erect above; the anthers connive around the included stigma, and are oblong, cordate and apiculated; like those of *Hyoscyamus*, they are articulated upon a prominence of the dorsal connective. The ovarium is seated upon a short hypogynous gland with two prominent lobes, opposite the furrows of the dissepiment; these lobes remain after the growth of the ovarium, but the gland itself soon disappears. The stigma is capitate, somewhat 2-lobed, and covered with numerous viscose papillæ. I observed the fruit of a specimen in M. de Boissier's herbarium (*M. microcarpa* from Malaga); here the persistent calyx preserves the same form, the tube growing to a diameter of 7 lines and a length of 6 lines, while the erect lobes in addition are 9 lines long; it is membranaceous, reticulated, and incloses an oval berry crowned with the persistent style, being 7 lines long and 5 or 6 lines in diameter; the seeds are flat, reniform, oval, and about $1\frac{1}{2}$ line long *.

Anthocercis.

This genus of Labillardière was first arranged together with *Duboisia* in a separate division of *Solanaceæ* by Mr. Brown (Prodr. 448). Mr. Bentham, first in Lindley's 'Introd.' p. 292, and subsequently in the 'Prodromus' of DeCandolle, x. 191, placed it among *Scrophulariaceæ*, in his tribe *Salpiglossideæ*. About four years ago (*huj. op.* vol. i. p. 170), I offered several remarks, with the intent of showing that it possessed many peculiar features not before observed, quite distinct from *Salpiglossis* and its allied genera, for which reason I suggested its association with *Duboisia* and *Anthotroche*, in a separate tribe (*Duboisieæ*), forming a section of an extensive group, distinct as well from true *Solanaceæ* as from *Scrophulariaceæ*, and which group I proposed as an intermediate family (*Atropaceæ*) between the large natural orders just mentioned. The reason of its being placed in *Scrophulariaceæ* by Mr. Bentham was obviously on account of its didynamous stamens, notwithstanding the presence of a rudimentary fifth: at that time, however, the closely allied genus *Anthotroche*, with five regular fertile stamens, was not known. I have since shown that nearly half the genera heretofore placed in *Solanaceæ* present unequal stamens, with a strong tendency in many to assume a didynamous character; while, on the other hand, several unquestionable Scrophulariaceous genera have five regular and equal stamens. The obliquity of the corolla and irregular dimensions of its segments, and the unequal size of the

* An analysis of the generic features of this genus are given in one of the supplementary plates at the end of this volume.

stamens or partial suppression of the fifth, are therefore no longer found to offer unerring limits of demarcation between those families, and I have pointed out the existence of other characters that can be more safely relied upon for this purpose, viz. the æstivation of the corolla and structure of the seed: these, taken in conjunction with the usual ordinary distinctions, afford a more certain guide. Judged by these rules, *Anthocercis* will be seen not to belong to *Scrophulariaceæ*, and the position assigned to it above mentioned appears to me the most natural that can be suggested.

One very remarkable feature is the peculiar æstivation of its corolla, which I find to be a constant feature in every species: the somewhat unequal segments of its border are rolled inwards, with their margins overlapping one another respectively; in some the dextral, in others the sinistral edge remains uppermost, and the segments thus folded are drawn closely together into a long conical bud, with the apices somewhat imbricately interlaced: this very peculiar mode of æstivation will be best understood by reference to the diagrams I have given (*loc. cit.* p. 170).

It has always four fertile stamens arranged in pairs, of which one pair is longer than the other, with a shorter sterile filament or a mere rudiment of one, or else a vacant space in the interval between the longer stamens: the filaments originate near the base in the throat of the short constricted portion of the tube of the corolla, where they are most frequently ciliated and much geniculated at their origin, forming a fornix that conceals the ovary; they then assume a more erect position around the style, curving outward towards the summit, and are all slightly inclined, together with the style, towards one side of the more expanded portion of the tube.

I have frequently alluded to the fact of the extrorse position of the stamens among the *Duboisieæ*, where it occurs constantly. In *Duboisia*, *Anthotroche*, and another genus to be proposed, each anther consists of a single hippocrepiform cell; but in *Anthocercis*, although the anther is equally reniform and extrorse, it is formed of two divaricated curving cells, closely united at their apex; this bursts externally by two lines parallel with the margin. This extrorse position of the anthers appears to be otherwise quite unknown throughout the Solanal alliance, and would lead us to suspect that the *Duboisieæ* really belonged elsewhere, did not all the other characters unquestionably place them here. This anomaly is probably explained by a circumstance that in the course of this investigation fell under my observation: in *A. gracilis* I found a single flower with its corolla much distorted, where two of the stamens were hippocrepiform, 1-celled, and extrorse, as in *Anthotroche*, and the other two were bilocular,

with parallel cells, and introrse. A hint may be obtained from this accidental deviation from the ordinary form of development, and we may reasonably infer from the circumstance, that the unilocular hippocrepiform anther of *Anthotroche*, seen also in many genera of the *Scrophulariaceæ* and *Myoporaceæ*, is not formed, as has been usually supposed, by the confluence of the two cells, but by the total abortion of one of the ordinary lobes, the other and more external one assuming a crescent form, by its unrestrained development around a large globular pollen receptacle. We see a very close approximation to this irregularity in *Browallia*, where one of the anther-cells is much smaller and often very minute, always sterile, and void of pollen, while the other is reniform as in *Anthotroche*. In *Brunsfelsia* there is an evident confluence of two cells in a reniform shape, but in *Franciscea* there is a total abortion of one of the cells, and its curvature in a crescent form, as in *Anthotroche*.

For reasons assigned in another place, I have excluded *A. albicans* and *scabrella*, and added two that are new, making in all six species belonging to this genus, which are all found on the S.W. coast of Australia, between Swan River and King George's Sound. From an examination of these species I have found it necessary to modify, in the following manner, the character of this genus.

Anthocercis, Labill. Nov. Holl. ii. 19; R. Br. Prodr. 448; Endl. Gen. no. 3902; Iconogr. tab. 68; Benth. in DC. Prodr. x. 191.—Char. emendat.—*Calyx* campanulatus, 5-costatus, 5-fidus, laciniis acutis, carnosis, costis continuis, tubum æquantibus vel excedentibus, persistens. *Corolla* campanulata, tubo basi coarctato, hinc subito ampliato, limbo sub-inæqualiter 5-fido, laciniis acutis, sæpissime lineari-subulatis, patentibus, æstivatione applicativa, nempe loborum marginibus alterne dextrorsim et sinistrorsim mutuo supervolutis, apicibus subimbricatim internexis. *Stamina* 4, didynama, cum quinto postico ananthero sæpe rudimentario rarius deficiente, inclusa; *filamenta* complanata, imo latiora, et ad coarctationem tubi geniculatim inserta, et sæpius ciliata, superne attenuata et glabra, ad apicem paullo reflexa: *antheræ* extrorsæ, reniformes, bilobæ, profunde cordatæ, 2-loculares, utrinque rima margine parallela extus dehiscentes. *Pollen* oblongum, longitudinaliter 3-sulcatum. *Stylus* erectus, inclusus. *Stigma* pulvinatum, emarginato-bilobum. *Ovarium* subglobosum, disco carnoso plus minusve adnato obsessum, 2-loculare; *ovula* plurima, adscendentia, placentis imo dissepimenti tenuis superne fissi utrinque adnatis affixa. *Capsula* oblonga, rostrata, septicido-2-valvis, valvis integris, subcoriaceis, dissepimento incrassato

discisso, imo clausis, superne e marginibus introflexis apertis, hinc columna placentari libera sistente. *Semina* plurima oblonga, subincurva; *testa* crustacea, foveis amplis scrobiculata; *embryo* in axi *albuminis* carnosi copiosi tenuiter teres, fere rectus, *radicula* infera, cotyledonibus brevissimis obtusis ejusdem diametri 4-plo longiore, et *hilo* infra medium ventrali evitante.—Fruticuli *Australasiæ occidentalis glabri sæpe viscosi*; folia *integra vel pauci-dentata, subsessilia*: panicula *pseudo-terminalis, vel ab axillis novellis pauciflora*, floribus *pedicellatis, folio bracteiformi donatis*; pedunculo *sæpe medio 2-bracteato et hinc articulato*: corolla *ochroleuca vel albida, intus sæpissime purpureo-lineata.*

1. *Anthocercis viscosa*, R. Br. Prodr. p. 448; Benth. in DC. Prodr. x. 191; Bot. Mag. tab. 2961; Bot. Reg. tab. 1624.—A. littorea, *Endl.* (*non Labill.*) *Iconog.* tab. 68;—fruticosa, orgyalis, glabra, ramulis viscosis, foliis glabris, rotundato-obovatis (junioribus cuneato-oblongis, sub-puberulis), e medio cuneatis, imo in petiolum brevem decurrentibus, crassiusculis, serrulatis, utrinque impresso- et viscoso-punctatis; pedunculo (seu ramulo) axillari, 1–3-floro, apice 2-bracteato, pedicello paullo supra bracteas articulato, calycis lacinulis foliaceis lineari-acutis, corollæ ochroleucæ amplæ laciniis oblongo-acutis, reflexis, tubo lineis 25 viridibus striato æquilongis.—Swan River.—*v. s. in herb. plur.* (Drummond), *et v. v. in hort. Kew. cult.*

Mr. Bentham mentions a variety, *A. Baueriana*, taken from Bauer's drawing in Endlicher's 'Iconographia' above quoted, but I can perceive no difference in it from the typical plant, where the leaves are always more or less serrulate, and the tube of the corolla often somewhat narrower, as in the drawing referred to. This species has larger leaves and flowers than any other belonging to the genus, and is well distinguished by the many viscous glands imbedded in hollows on the surface of the leaves. The leaves are $1\frac{3}{4}$ to 2 inches long, including the petiole, and $\frac{3}{4}$ to $1\frac{1}{4}$ inch broad. The inflorescence is probably an abortive raceme. In Bauer's figure the peduncle above the bracts bears three flowers; all the specimens I have seen are 1-flowered, but that may result from the abortion of the others; the peduncle is 6 to 9 lines long; the bracts 4 to 6 lines in length; the pedicel, 9 to 12 lines long, is articulated a little above the point of insertion of the bracts; the tube of the calyx is 5 lines, its segments 5 to 6 lines in length; the corolla $1\frac{1}{2}$ to 2 inches long, the border, when expanded, $2\frac{1}{2}$ inches in diameter; in æstivation the lobes are somewhat unequal in length, the upper

lobe is a little shorter, the two lower lobes are a trifle the longest of all, and upon this side are placed the two longer stamens, which are nearly the length of the tube, with a short rudimentary filament between them; the stamens are quite glabrous; the anthers are 2-lobed, bursting extrorsely.

2. *Anthocercis littorea,* Labill. Nov. Holl. ii. 19. tab. 158; Benth. in DC. Prodr. x. 191; Bot. Reg. tab. 212; Sw. Fl. Aust. t. 17; Botanist, t. 102;—fruticosa, glaberrima, foliis cuneato-oblongis, integerrimis, vel nonnullis interdum spinoso-paucidentatis, sessilibus; inflorescentia e ramulis novellis pseudoracemosa, floribus axillaribus, subsolitariis, pedicellis basi bracteatis, corollæ laciniis lineari-acutissimis, tubo duplo longioribus, filamentis imo ciliatis, antheris 2-locularibus extrorsis. —Swan River et King George's Sound.—*v. s. in herb. Hook.* (Fraser).

This species is very distinct from the former, its perfectly glabrous leaves being narrower, more thick and fleshy than in the former species; they are $1\frac{1}{4}$ inch long, 4 to 6 lines broad. The young axillary branchlets are floriferous, producing fresh flowers as they become elongated, from 6 lines or an inch in length, until they bear the appearance when in fruit of a many-flowered raceme 3 to 4 inches long: the pedicel is slender, 2–3 lines in length, becoming thickened in fruit, and 6 lines long; the calyx, 3 lines in length (including the linear fleshy segments of 2 lines), is 5-keeled; the corolla is 8–9 lines in length, of a sulphur-yellow colour, smooth outside; the tube is 3 lines long, sparsely clothed inside with pulverulent glandular down, the segments of the border are very narrow and acute, 5–6 lines in length, expanded, each with a rounded intervening sinus: the capsule, somewhat rostrated, supported by the persistent calyx, is 4–7 lines long, and contains numerous oblong seeds; it is 2-valved, somewhat fleshy, the valves being thick and coriaceous, completely septicidal below, and introflexed on their margins above, the placentiferous column, which is adnate below, free above, and split at its apex, remaining in the central space; the seeds are small and deeply scrobiculate; the embryo as above described.

3. *Anthocercis ilicifolia,* Hook. Bot. Mag. sub t. 2961; ibid. tab. 4200; Benth. in DC. Prodr. x. 192;—glabra, ramulis fistulosis, virgatis, foliis inferioribus oblongis vel obovatis, angulato-dentatis, dentibus subspinosis, subsessilibus, utrinque glabris (vel sub lente papilloso-glandulosis), textura quam præcedentibus tenuiore: inflorescentia subterminali, valde ramosa et elongata, floribus alternis, distantioribus, pedicello

filiformi e bracteis 2 sessilibus orto, calyce parvo 5-carinato, dentibus linearibus carnosis acutis, corollæ sulphureæ tubo campanulato, subventricoso, 15-striato, laciniis lineari-lanceolatis æquilongo.—Swan River (Drummond).—*v. s. in herb. plurimis.*

This species has a more herbaceous and virgate habit than the two preceding, from which it is readily distinguished by its compressed fistulose branching stems and thinner spinulose leaves; its primary branchlets are 10 inches long, its secondary 4 to 6 inches, and its ternary aphyllous and floriferous ramifications are 1 to 3 inches long; the pedicels are alternate, solitary, filiform, 3 lines long, and spring out of two sessile minute bracts; the calyx is sharply 5-keeled, $1\frac{1}{2}$ line long, the keels being extended into as many sharp setiform teeth, longer than the tube; the tube of the corolla is 3 lines long, somewhat ventricose, with five narrow linear segments of about the same length; the stamens are quite glabrous, geniculated at their insertion in the contracted base of the tube, the longer pair being about two-thirds of its length; the anthers consist of two nearly parallel lobes slightly cordate at base, fixed extrorsely on the filaments, and bursting by two furrows externally; the hypogynous gland is quite adnate, somewhat flattened, and supporting the oblong ovary; the style is filiform, 2 lines long; the capsule is 5 lines long, formed like that of the preceding species.

4. *Anthocercis glabella*, n. sp.;—glaberrima, subviscosa, ramulosa, ramulis debilibus, pallide viridibus, angulosis; foliis lineari-oblongis, obtusis, imo angustioribus, sessilibus, carnosulis, glandulis viscosis minutissimis punctulatis; racemulo brevissimo, axillari, bracteato, 2–3-floro; pedicello sub-brevi; calycis viscosi segmentis linearibus, acutissimis, tubo 5-costato 3plo longioribus et corollæ tubum æquantibus; corollæ limbi laciniis linearibus, intus papilloso-rugosis, tubo infundibuliformi 3plo longioribus; staminibus 2 longioribus faucem vix attingentibus, 5to deficiente; capsula oblonga, longe rostrata, calyce suffulta.—Swan River.—*v. s. in herb. Mus. Brit.* Freemantle (Gilbert).

A species near *A. littorea*, differing in its much more slender habit, sub-herbaceous deeply angled stems and branches, and smaller and more linear leaves; here the divisions of the calyx are longer, equalling the length of the tube of the corolla, which is less campanulate than in *A. littorea*; the segments of the border are also narrower and much longer, being three times (not twice) the length of the tube. The leaves are fleshy, veinless, and exhibit under the lens a number of minute shining vis-

cous glands; they are from 10 to 18 lines long, $2\frac{1}{2}$ lines wide, and 1 line broad at the base; the pedicel measures 3 lines; the tube of the calyx, somewhat viscous and deeply costate, is $\frac{3}{4}$ line, and its teeth $1\frac{3}{4}$ line long; the tube of the corolla is $2\frac{1}{2}$ lines, its segments $7\frac{1}{2}$ lines long; the immature capsule measures 7 lines in length and 2 lines in breadth.

5. *Anthocercis gracilis*, Benth. DC. Prodr. x. 192;—glaberrima, ramosissima, ramulis teretibus, tenuiter virgatis, striatis, fistulosis; foliis inferioribus . . . . , mediis spathulato-elongatis, in petiolum tenuem angustatis, carnosis, superioribus anguste linearibus, bracteiformibus; floribus solitariis, axillaribus, pedicello filiformi, calyce parvo, 5-carinato, corollæ tubo purpureo, 15-lineato, subventricoso, fauce glanduloso-pulverulenta, laciniis anguste linearibus, tubo 2-plo longioribus, filamentis glabris, 2 longioribus tubo dimidio brevioribus; capsula ovata, 2-valvi, valvis dissepimento lunato septicidali imo clausis.—Swan River (Drummond).—*v. s. in herb. Hook. et aliis.*

This has a habit almost herbaceous, and still more virgate and slender than the preceding; the lower leaves are wanting in the specimens I have seen; the medial leaves are 7 lines long, 2 lines broad at the rounded apex, diminishing into a long slender petiole; those above are of the same length and only $\frac{1}{3}$rd of a line broad: the pedicel is 2 lines long, the calyx 2 lines, the tube of the corolla 2 lines, the linear segments of the border are 4 lines in length: the capsule is 3 lines long and $1\frac{1}{2}$ line in diameter.

6. *Anthocercis anisantha*, Endl. Stirp. Austr. Decad. p. 13; Benth. in DC. Prodr. x. 192;—viscoso-pubescens, ramis ramulisque spinescentibus; foliis in ramulorum axillis fasciculatis, oblongo-cuneatis, obtusis, integerrimis; calycis dentibus tubo æquilongis, lineari-lanceolatis; corollæ laciniis anguste linearibus, tribus brevioribus; capsula ovata.—In Australiæ austro-occidentalis interioribus.

The tube of the calyx is said to be 1 line long, and its teeth of equal length: the tube of the corolla 2 lines, and its two longer segments of the same length.

7. *Anthocercis genistoides*, n. sp.;—fruticosa, glaberrima, spinulosa, valde dichotomo- et intricato-ramulosa, ramulis gracilibus, flexuosis, virgatis, striatulis, alaribus spiniformibus, mucroneque pungente apiculatis; foliis parvulis, sessilibus, anguste linearibus, carnosulis, spinis multo brevioribus; floribus paucis, solitariis, axillaribus, pedicello breviusculo imo 2-bracteo-

lato; calycis glabri parvi 5-costati dentibus setiformibus; corollæ luteæ laciniis lineari-acutis, tubo 15-striato paullo longioribus, staminibus 2 longioribus tubo tertio brevioribus, filamentis imo subciliatis, antheris rotundatis, cordatis, 2-locularibus, extrorsim dehiscentibus.—Australia austro-occidentalis (Drummond, 86).—*v. s. in herb. Hook.*

This is evidently closely allied to the preceding, but differs in its perfectly glabrous habit and solitary small linear fleshy leaves, which are 4 to 6 lines long, half a line broad: the flexuose virgate branchlets are 5 to 10 inches long, terete, striated, perfectly glabrous, with numerous slender striated floriferous spines from 4 to 10 lines long, which are terminated by a hard sharp osseous mucronate point 1 line in length: the pedicel is 2 lines long; the tube of the calyx 1 line, its teeth the same length; the tube of the corolla 2 lines, its lobes 4 lines*.

Cyphanthera.

I propose to separate from *Anthocercis* those species, conforming with some others that I find undescribed, which differ in being more or less covered with dense tomentum formed of brachiate hairs, in a calyx of different form, but principally in its unilocular anthers, resembling those of *Anthotroche* and *Duboisia*, where the cell is concentrically bent around a globular polliniferous receptacle, and extrorsely fixed upon the filament, which is always glabrous: its capsule is not long, rostrated, 2-valved and septicidal, as in *Anthocercis*, but oval, more or less 4-valved and septifragal, with a lunated free dissepiment; it is intermediate with *Anthocercis* and *Anthotroche*. The observations made upon *Anthotroche*, which for the most part apply to this genus, need not be repeated here. The species of *Anthocercis* are glabrous or viscous, and are all found on the western coast of the Australian continent; in this genus, on the contrary, the species are all more or less tomentose, and, with one exception, found on the eastern side, or in Van Diemen's Land. Its generic name, like that of *Anthotroche*, is derived from the peculiar form of the anther, *κυφὸς, incurvus*; *ἀνθηρὸς, anthera*, and its character may be thus defined:—

Cyphanthera, gen. nov.—*Calyx* poculiformis, submembranaceus, 5-dentatus, persistens. *Corolla* tubuloso-campanulata, imo coarctata, hinc ampliata, limbi laciniis 5, subæqualibus, oblongis, interdum lineari-angustatis, patentibus, æstivatione

* Drawings and analytical details of this and of the five first species, will be given in Supplementary Plates, at the end of this volume

(ut in *Anthocercide*) applicativa. *Stamina* 4, inclusa, didynama, cum quinto postico inter 2 longiora rudimentario, vel deficiente; *filamenta* glabra, imo complanata, et in coarctationem tubi geniculatim inserta, superne magis attenuata, apice reflexa; *antheræ* extrorsæ, rotundato-reniformes, hippocrepicæ, 1-loculares, extus rima circulari margine parallela 2-valvatim hiantes, tunc peltatæ, receptaculo pollinis in medio globoso. *Ovarium* oblongum, basi induvio corollæ circumscissæ circumdatum, et disco sublibero sublobato obsessum, 2-loculare; *ovula* plurima adscendentia, placentis imo dissepimenti superne fissi utrinque adnatis affixa. *Stylus* filiformis, longitudine staminum. *Stigma* emarginato-pulvinatum. *Capsula* subglobosa, calyce vestita, septifrage 4-valvis, valvis subcoriaceis, dissepimento incrassato, libero, lunato, medio utrinque seminifero. *Semina* plurima, et *embryo* ut in *Anthocercide*. —Fruticuli *in Australasia orientali et Insula Diemen crescentes, pube brachiato tomentosi*; folia *integra, sessilia, plus minusve tomentosa*; inflorescentia *breviter pseudo-racemosa, pedicelli e glandis stipitatis glabris cupuliformibus solitarii*, corolla *flava vel ochroleuca, lineis parallelis striata.*

1. *Cyphanthera frondosa*, n. sp.;—fruticosa, valde ramosa, ramis cortice rimoso in lineis interruptis elevato-striatis; foliis spathulato-oblongis, in petiolum brevissimum attenuatis, coriaceis, margine cartilagineo subrevolutis, supra glabris, subtus ferrugineis, subglabris, vel sub lente sparse glanduloso-pubescentibus, nervis breviter transversalibus (utrinque circiter 8) intra marginem arcuatim confluentibus; paniculis paucifloris, terminalibus, axillaribusque, subtomentosis, bracteis linearibus, obtusis, membranaceis; calyce 5-dentato; corolla fere tubulosa, limbi laciniis acutiusculis, tubo duplo brevioribus; filamento rudimentario inter stamina longiora.—Sydney (in Hort. Bot. cult. et e Terra Diemen forsan introducta).—*v. s. in herb. Heward.* (A. Cunningham).

This very distinct plant was placed by Cunningham as a species of *Myoporum*, and found in a bundle of specimens collected by him chiefly in the Botanic Garden at Sydney; from its resemblance to the following species, it has probably been introduced from Van Diemen's Land, or perhaps collected there by that botanist. The leaves are numerous, thick, coriaceous, of dull aspect, $1\frac{1}{2}$ inch long, including the petiole, upon the margins of which they are decurrent to the base, and 3 or 4 lines in breadth. The inflorescence is pseudo-paniculate, out of the approximated axils of the more recent branches, from the young crowded leaves of which proceed a number of aggregated short racemes of little more than half an inch long, all covered slightly

with soft pubescence, and consisting of a number of linear bracts or leaflets, from the base of each of which a solitary pedicel arises; these, in fact, are probably only incipient branchlets, which, as in *Duboisia*, gradually lengthen into long seed-bearing ramifications: in this early state of development the flowers appear therefore crowded in the extremities of the younger growing branches; the bracts are linear, a line long; the pedicels are of equal length; the pubescent calyx, cupshaped and crowned with five short teeth, is $\frac{3}{4}$ line long; the somewhat tubular yellow corolla, marked with fifteen striated lines, is $2\frac{1}{4}$ lines long, including the oblong and somewhat acute segments of its border, which are one-fourth of its whole length, and slightly covered on both sides with short glandular hairs: the two longer stamens are $\frac{3}{4}$ the length of the tube, with a short rudimentary filament between them, and the shorter pair are about half the length of the others; the filaments are much dilated at base, smooth, and fixed a little above the base of the tube; the ovary is oblong, half immersed in the induvial base of the circumscissile corolla.

2. *Cyphanthera Tasmanica.* Anthocercis Tasmanica, *Hook. fil. MSS.*, n. sp.;—fruticosa, ramulis cinereo-tomentellis; foliis crebris, lanceolato-oblongis, apice obtusiusculis, e medio gradatim angustatis, imo linearibus et sessilibus, margine valde revolutis, sulcato-nervosis, supra stellato-scabridis, subtus pulverulento-tomentosis, pube cinerea aut flavescente; floribus pallide flavis, axillaribus, solitariis, e turionibus pseudo-paniculatis, pedicello imo bibracteato, calyceque cinereo-tomentosis, segmentis calycis corollæque linearibus; capsula globosa, 4-valvi, calyce vestita.—Van Diemen's Land.—*v. s. in herb. Hook. ex ora orientali* (Gunn, 1992).—Kelveden, Great Swanport (Backhouse).

This species has great analogy with the former, but bears a much lighter aspect. It is a shrub from 6 to 10 feet in height, the branches densely tomentose; the leaves, somewhat crowded, are 1 or $1\frac{1}{2}$ inch long, 5 or 6 lines in breadth, with the margins much reflexed, attenuated at base into a short petiole, stellately scabrous above and tomentose beneath: the inflorescence is of the same character as the last species, but the flowers are much larger and of a brighter yellow; the pedicel is $1\frac{1}{2}$ line long; the tube of the calyx is more campanulate, about 1 line in length, the segments being linear, acute, and of the same length as the tube; it is altogether tomentose inside as well as outside: the tube of the corolla is more infundibuliform, 3 lines long, and the segments of its border of the same length, linear-oblong and acute at the apex, the whole pubescent outside; the longer stamens are two-thirds, the shorter pair one half the length of the

tube; the style equals the longer pair of stamens; the ovary is oblong, half a line long, seated in a free cupuliform disk; the capsule is nearly globular, about 2 lines in diameter, and 4-valved, two seeds only being perfected in each cell.

3. *Cyphanthera cuneata*, n. sp.;—fruticosa, ramis decurrenti-angulatis, nitidis, foliis spathulato-oblongis, obtusiusculis e medio sensim in petiolum brevissimum cuneatis, margine subrevolutis, pallidis, vetustioribus utrinque glabris, superne minutissime punctato-rugosis, subtus viscosis, nervis brevibus transversalibus intra marginem arcuatis, junioribus stellato-pubescentibus, vel pilis mollibus brachiatis tomentosis; floribus in ramulis novellis brevibus pseudo-paniculatis, pedicellis gracilibus, e cupula crassa singulatim ortis, articulatis; calyce 5-dentato glabro, corollæ omnino glabræ tubo campanulato infundibuliformi calyce 4-plo longiore, laciniis acutis patentibus tubo paullo brevioribus.—Novæ Hollandiæ Prov. Camden.—*v. s. in herb. Lindley.*

In this plant the leaves in their form and venation resemble those of *Duboisia myoporoides*, but they are much smaller and of thinner texture; they are $1\frac{3}{4}$ inch long, including the petiole of 3 lines, and are 4 lines broad; the young floriferous branchlets are barely half an inch long, the lower nodes are furnished with small leaflets, the upper nodes are bare; the pedicels, $1\frac{1}{2}$ line long, are solitary out of each node, which is always stipitate and cupular as in the preceding species and in *Duboisia*: the calyx, of thin texture, is half a line in length and breadth; the tube of the corolla is 3 lines long, the segments $1\frac{1}{2}$ line, all quite glabrous and yellow.

4. *Cyphanthera albicans.* Anthocercis albicans, *Cunn. in Field N.S. Wales, App.* 335; *Sw. Fl. Austr.* t. 16; *Benth. in DC. Prodr.* x. 192;—fruticosa, ramosissima, undique tomento brachiato cinereo vestita; foliis parvis, oblongis, margine subrevolutis, subsessilibus, patentibus, supra cinereo- subtus albido-tomentosis; floribus axillaribus et subterminalibus, pedicellis solitariis e cupula sessili ortis, calyce brevi poculiformi, carinato, glabro, rarius pubescente, dentibus late-lanceolatis acutis cum carinis continuis, corollæ ochroleucæ glabræ laciniis lanceolatis, tubum subcylindricum striatum subæquantibus.—Nova Hollandia, in mont. prope Bathurst.—*v. s. in herb. Hook.* (A. Cunningham), *et v. v. in hort. Kew. cult.*

This is much branched and densely crowded with small grayish tomentose leaves 3 to 5 lines long, $1\frac{1}{2}$ to 2 lines broad; the flowers proceed from the extremities of the very young branch-

lets, which are densely clothed with thick cottony tomentum, out of which issue four or five alternate projecting glabrous hollow cups, some of which are bare, but generally from each arises a solitary slender woolly pedicel 1 line long: the calyx is commonly glabrous, very rarely pubescent, a line long: the tube of the campanular corolla is 2 lines long, and its segments are about the same length.

5. *Cyphanthera tomentosa*. Anthocercis albicans, *var*. tomentosa, *Benth. in DC. Prodr*. x. 192;—fruticulosa, ramis virgatis, cano-tomentosis; foliis sessilibus, oblongis, margine revolutis, basi latioribus, refractis, supra cano-pruinosis, subtus cano-tomentosis; floribus paucis, in axillis solitariis, calycis campanulati ecostati dense tomentosi dentibus late ovatis, subacutis; corollæ ochroleucæ glabræ laciniis oblongis, acutis, tubum striatum subæquantibus.—Nova Hollandia in "Peele's range," flum. Macquarie.—*v. s. in herb. Hook. et Mus. Brit.* (A. Cunningham, no. 240).

Although closely related, this appears more than a mere variety of the former species, differing in its more slender and more virgate habit, the shape of its more refracted and more distant leaves, its much shorter and white tomentum, and the shape of its tomentose calyx. The leaves are much more diffuse, somewhat conduplicate, 5–7 lines long, 2 lines broad; the pedicel is 2 lines long, rather stout; the calycine cup is barely a line long and wide, with five broad triangular teeth of nearly equal length; the corolla is about the size of that of the former species.

6. *Cyphanthera scabrella*. Anthocercis scabrella, *Benth. in DC. Prodr*. x. 192;—fruticulosa, tota pube substellata scabrella, ramulis gracillimis, elongatis; foliis parvis, elliptico-oblongis, margine revolutis, breviter petiolatis; floribus ad apicem ramulorum novorum subsolitariis, pedicellis gracilibus calyce 2–3-plo longioribus, calycis glabri laciniis lanceolato-subulatis, sinubus latiusculis; corollæ parvæ laciniis linearibus, tubo subduplo longioribus.—In Novæ Hollandiæ montibus cæruleis.—*v. s. in herb. Hook.* (A. Cunningham).

This is a plant with still more slender branches than the last, with more glabrous and smaller leaves, and all sparsely covered with very short rigid ramose or branching hairs, making it almost scabrous: the leaves are about 4, rarely 5 lines long and 2 lines broad, upon a very short slender pubescent petiole: the flowers are few and almost solitary at the termination of the nascent branchlets, upon a capillary pedicel 3 lines in length; the calyx, including the narrow teeth, which are half its length,

is 1 line long, it is membranaceous with rounded intervals between the teeth; the corolla is tubular, campanular above, marked with fifteen dark parallel lines, and the border is divided into five very long linear segments: the shorter pair of stamens are half the length, the longer pair two-thirds the length of the tube, with a fifth filament intermediate with the latter and half the length of the former, bearing at its apex a small glandular lobe: the ovary is seated on an adnate disk with its margin undulated, and the style is articulated at its base.

7. *Cyphanthera ovalifolia*, n. sp.;—fruticosa, ramis subpubescentibus, ramulis virgatis, dense griseo-tomentosis; foliis parvulis, ovalibus, patentibus, sessilibus, margine revolutis, crassis, supra fusco- subtus grisco- vel fulvo-tomentosis, pube brevissima rigida, intricato-brachiata; floribus brevissime subpaniculatis, 1-2-3-ve, axillaribus, pedicellis 1-floris, singulo e cupula stipitata orto; calycis utrinque hirsutuli brevis segmentis acutis, tubo æquilongis; corollæ laciniis oblongo-acutis, tubum campanulatum calyce duplo longiorem 15-striatum subæquantibus; capsula parva, globosa, imo calyce induta.—Nova Hollandia, W. M'Arthur.—*v. s. in herb. Hook.* (Backhouse).

This species is very much of the same aspect as the three preceding, but is readily distinguished by its spreading, small, oval, sessile leaves, densely covered with thick tomentum; these are 3 to 4 lines long, $1\frac{1}{2}$ to $2\frac{1}{2}$ lines broad; the axillary raceme is very short, presenting the appearance of three or four alternate cupshaped nodes, out of each of which (or some of them are abortive) proceeds a slender pedicel 1 line long, bearing a calyx of equal length, which is pubescent within, as well as outside; the campanular corolla, of which the tube is $1\frac{1}{2}$ line long, has rather broad acute segments of the same length; the stamens are of the same proportional length as in the preceding species, with a very short sterile filament between the longer pair; the disk, adhering to the base of the ovary, has an undulating or lobed margin: the capsule is globular, nearly 2 lines in diameter, and half enclosed in the persistent calyx, has four thickly coriaceous valves, containing six seeds and a ligneous crescent-shaped dissepiment.

8. *Cyphanthera microphylla*, n. sp.;—fruticulosa, intricato-ramulosa, ramulis flexuosis vel dichotome brachiatis, striatulis, viridulis, glabris; foliis minutis, sessilibus, ovalibus, carnosulis, ramulisque junioribus viscoso-scabrellis; floribus solitariis, axillaribus, pedicello elongato, calyceque poculiformi breviter 5-dentato glanduloso-scabrellis; corollæ flavæ laciniis oblongis, obtusiusculis, tubo utrinque glabro sub-campanulato vix bre-

vioribus, intus glanduloso-pubescentibus; staminibus tubo paullo brevioribus, fere æquilongis, puncto rudimentario inter longiora.—In Australiæ austro-occidentalis interioribus.—*v. s. in herb. Hook.* (Drummond, 177, anno 1849).

This species is extremely different in its habit from any of the former, approaching more in appearance to *Anthocercis genistoides*, but the structure of its flowers and of its capsule is completely that of *Cyphanthera*: the leaves are scarcely a line in length and half a line in breadth, so that the plant appears almost aphyllous: the pedicel is from 2 to 3 lines long, the calyx is 1 line long, the tube of the corolla is 2 lines, the lobes $1\frac{1}{2}$ line in length; the longer stamens are nearly the length of the tube, the other pair very little shorter, the anthers being all 1-lobed, roundly hippocrepiform and extrorse, and after dehiscence, of the shape of a peltate disk with a globular prominence in the centre; the disk that surrounds the base of the ovary is entire and free on the margin, and the ovary is surmounted by a prominent 4-grooved gland, into which the style is articulated, as occurs in some other species. The capsule is small, globular, about a line in diameter, its four valves being thin and testaceous, its free lunate dissepiment membranaceous, and it contains 4 to 6 seeds, which are almost the length of the valves*.

Anthotroche.

This genus was first made known by Endlicher in his 'Genera Plantarum,' p. 1404, his short description of the only species being published in his 'Nov. Stirp. Mus. Vindob.' p. 7. It was placed by him among the *Salpiglossideæ*, but referred by Mr. Bentham to *Solanaceæ*, no doubt because of the more isomerous structure of its flowers. I first called attention in 1849 to the singular fact of the extrorse position of the stamens, and confirmed the general analogy of its characters to *Anthocercis*. Lately it has been noticed by M. A. DeCandolle, 'Prodr.' xiii. 676, as a genus to be excluded from *Solanaceæ*, and referred to *Scrophulariaceæ*, because of its unilocular reniform anthers; its generic character there given is literally copied from the original diagnosis of Endlicher, entirely omitting the remarkable features indicated by me (*huj. op.* i. 171). The unilocular anther, as in *Verbascum*, is however not peculiar to the *Scrophulariaceæ*, for though occurring in several cases, it is there more an exception than a general rule, being at the same time common in other families, for instance in the *Myoporaceæ*: indeed, abundant

* A sketch of each plant and analytical details of the structure of each species of this genus, will be shown in supplementary plates, at the end of this volume.

evidence has been given to prove, as I have remarked in regard to *Anthocercis*, that neither the structure of the anther, nor even the didynamous character of the stamens, are by themselves sufficient to retain a doubtful genus within the limits of the *Scrophulariaceæ*. The fact, in combination with other circumstances, that manifestly determines the position of *Anthotroche* among the *Atropaceæ*, rather than in *Scrophulariaceæ*, is the structure of the seed; this resembles that of *Anthocercis*, *Cyphanthera* and *Duboisia*; it is cylindrical, slightly curved, containing, enveloped in albumen, a nearly straight cylindrical embryo, with minute cotyledons, and a terete radicle pointing to the base of the seed, the hilum being on the lateral ventral sinus. Whatever may be its true position, one conclusion is certain, that where *Anthocercis* is placed, *Anthotroche* must accompany it. This agreement is evident, not only in their similarly extrorse stamens, but in the æstivation of the corolla; this last feature is not so easily distinguished in the last-mentioned genus, on account of the shortness of the lobes of its border, and their being densely covered on both sides with long branching hairs, which, being closely interlaced, conceal the margins. It differs however from *Anthocercis* and *Cyphanthera* in the more expanded and almost rotate form of its corolla, its shorter and more obtuse lobes, and in its stamens being all perfect and equal in number to the segments of the border, although one of them is somewhat shorter. The peculiarity in the form of its anther consists in its being, like that of *Cyphanthera* and *Duboisia*, roundly discoid and deeply reniform; its attachment to the filament is in the deep sinus upon the side looking toward the style, while the external face is marked by a nearly annular groove that runs concentrically near the margin: along this line it bursts widely open, in an almost peltate form, by its two nearly equal gaping valves, showing a globular prominence in the middle, which is the receptacle of the pollen. This structure is the result, as I have already shown (*app.* 23), of the total abortion of one of the lobes that ordinarily constitute an anther, and not, as generally supposed, of the confluence of the two lobes. *Anthotroche* offers another distinguishing feature, in its perfectly free cup-shaped disk, that invests the base of the ovary: this must not be confounded with a somewhat similar appearance in *Anthocercis* and *Duboisia*, where the corolla breaks away by a circumscissile line, leaving a membranaceous cup surrounding the base of the ovary, as in *Lycium*, *Fabiana*, *Nierembergia*, *Sessea*, *Vestia*, *Cestrum* and some others: the disk, although also existing in *Anthocercis* and *Duboisia*, is not free to the base, as in *Anthotroche*, but is wholly adnate, and often inconspicuous, its obsolete lobes being sometimes almost free. The segments of the calyx and corolla are

frequently six, when the stamens correspond in number: under the usual pentamerous development, one or two of the lobes of the border and one of the stamens are sometimes smaller and defective, but this appears always caused by the injuries produced by insects, to which the flowers are subject, rather than the consequence of any real irregularity.

The following is an amended description of its generic character:—

Anthotroche, Endl. Gen. Pl. p. 1404; Nov. Stirp. Mus. Vindob. 7; A. DC. Prodr. xiii. 674.—Char. emend.—*Calyx* campanulatus, ultra medium 5–6-fidus, laciniis subacutis, extus lanato-tomentosus, intus glanduloso-pubescens, persistens. *Corolla* extus lanato-tomentosa, tubo basi breviter cylindrico, dein late campanulato, limbo explanato-rotato, 5–6-partito, laciniis subæqualibus, utrinque tomentosis, æstivatione (ut in *Anthocercide*) applicativa. *Stamina* 5–6, inclusa, tubi coarctatione ex annulo dense tomentoso orta, *filamenta* hinc complanata, valde geniculata et barbata, superne glabra, et tenuiora, apice reflexa; *antheræ* rotundatæ, profunde cordatæ, versus sinum affixæ, extrorsæ, 1-loculares, 2-valves, rima hippocrepiformi extus dehiscentes, receptaculo pollinis in fundum globoso. *Pollen* globosum, reticulatum. *Ovarium* obovatum, dimidio basali disco libero cupulari carnoso margine crenato circumdatum, 2-loculare: *ovula* plurima, adscendentia, placentis utrinque dissepimento adnatis affixa. *Stylus* filiformis, apice incurvus. *Stigma* clavatum, sub-bilobum. *Capsula* ovata, calyce recondita, 2-locularis, septifrage 4-valvis, valvis coriaceis, dissepimento plano, lunato, coriaceo, soluto, imo seminifero, superne fisso. *Semina* tereti-oblonga, subincurva, *hilo* infra medium facici ventralis affixa, *testa* favoso-scrobiculata. *Embryo* (sec. Endl.) in axi *albuminis* carnosi, *cotyledonibus* brevissimis obtusis, *radicula* infera tereti, basi incurva, imo spectante.—Frutex *Australasiacus ramosus, pube brachiato densissime lanato-tomentoso vestitus*; folia *alterna, ovata vel obovata, integra, crassiuscula, brevissime petiolata, juniores in ramulis novellis valde conferti, et hinc* flores *solitarii, subsessiles, parvi, violacei, valde approximati, et subterminales*: calyx et corolla *dense tomentosi*.

1. *Anthotroche pannosa*, Endl. *loc. cit.*; Walpers, Rep. iii. 236; DC. Prodr. xiii. 676;—fruticosa, tomento cinereo dense pannosa, ramis pedalibus, ramulis alternis, foliis obovatis vel ovatis, obtusissimis, basi nonnihil attenuatis, brevissime petiolatis, crassiusculis, adultis stellato-pubescentibus, junioribus densissime tomentosis, imbricatim aggregatis; floribus soli-

tariis, subsessilibus, imo bracteatis, limbo violaceo, lineis purpureis picto, capsula calyce immutato obtecta.—Australasia, ora orientali ad Swan River.—*v. s. in herb. Hook. et Lindley.* (Drummond).

This plant has a very peculiar aspect, greatly resembling that of *Leucophyllum*, being densely covered with long grayish tomentum, the hairs of which are, in like manner, flexuosely branched and matted together, and often stellated at some of the joints; this falls off in the older leaves, which are then marked by several distinct stellated points. The leaves are 10 to 12 lines long (including the very short petiole of half a line) and 5 to 6 lines broad; they are entire, fleshy, without apparent nervures, somewhat rugose, and concolorous on both sides: the young leaves and flowers are crowded in the nascent branchlets, the corolla being small and of a violet hue: the tube of the calyx is 2 lines long, terminated by five equal teeth 3 lines in length, the obtuse bract being 3 lines long and 1 line broad; the basal contracted portion of the tube of the corolla is $1\frac{1}{2}$ line long, 1 line in diameter, hence it is suddenly campanular, another line longer, and 3 lines in diameter across the mouth, where it is terminated by five subequal expanded segments, each $1\frac{1}{2}$ line long and 1 line broad, expanded to a diameter of 6 lines. The capsule is $2\frac{1}{2}$ lines long and broad; the seeds are $\frac{1}{2}$ line in length and barely $\frac{1}{8}$ line in diameter: in the structure of the capsule and seed there is much analogy with that of *Leucophyllum**.

Duboisia.

This genus, first established by Mr. Robert Brown in his 'Prodromus,' is very closely allied to *Anthocercis*, *Cyphanthera* and *Anthotroche*, scarcely differing from the former except in its baccate fruit. It was subsequently well figured by Endlicher in his 'Iconographia,' from drawings of the celebrated artist Ferd. Bauer, who accompanied Mr. Brown in his Australasian travels. It was placed by Mr. Bentham in his tribe *Salpiglossideæ*, but subsequently I pointed out the features that separate it from the *Scrophulariaceæ*, and suggested its true position in the system among the *Atropaceæ*, in the tribe *Duboisieæ* (*huj. op.* i. 165). Since the description of the typical plant, now forty-three years ago, no other species has been known, and that was called *D. myoporoides* by Mr. Brown, on account of the similarity of its habit to *Myoporum*. This genus, indeed, serves to connect the *Atropaceæ* with the *Myoporaceæ*, as at present limited, through *Disoon*, which has a monopetalous corolla with five equal seg-

* A figure of this plant, with ample details of its structure, will be given in a supplementary plate at the end of this volume.

ments, having an imbricated æstivation, with the same peculiar involution of the margins, as in the *Duboisieæ*. Like *Anthotroche* it has didynamous stamens, with similarly formed anthers, only that they are introrse: it has also a bilocular ovarium, but each cell has only a solitary suspended ovule; its fruit is also drupaceous and bilocular; of its embryo nothing is known: should it even have a superior radicle, as is most probable, its ordinal tendency would even then appear to lean more towards the *Scrophulariaceæ* than to the *Myoporaceæ*. The same may be said of *Nesogenes*, judging from the description given of its structure. The chief distinction between the *Scrophulariaceæ* and the bilocular section of the *Myoporaceæ* consists in the different direction of the embryo, but this character is of little value, as it arises merely from the more pendent or ascending position of the ovules, and in both cases the radicle points alike to the hilum. We must remember that exceptional cases of this kind occur in *Scrophulariaceæ*, for instance in *Leptorhabdos*, *Melampyrum* and *Tozzia*, which also have only two suspended ovules, where sometimes only a single seed becomes perfected, and where from its pendulous position the radicle is superior, contrary to the usual character of the family. Under such views, the ordinal tendencies of *Leptorhabdos* and *Disoon* appear to point in the same direction, from which the baccate fruit of the latter would not exclude it, because, although a rare occurrence in *Scrophulariaceæ*, this does sometimes occur, as in *Halleria*, &c.: in *Atropaceæ* it is more frequent. Consequently it would be more consistent to refer to *Scrophulariaceæ* all the genera of the *Myoporaceæ* possessing a bilocular ovarium, where the ovules are attached to a simple dissepiment, and to confine the limits of the *Myoporaceæ* to those genera where the dissepiment is so greatly produced and introflexed as to produce four distinct cells, and often other pseudo-cells. The latter, according to the views of most botanists, offer a structure closely approaching that of the *Verbenaceæ* and *Borraginaceæ* (the *Echial* alliance of Prof. Lindley): the former clearly belong to one of the orders of the great *Solanal* alliance as above suggested: the distinction in point of structure is considerable and manifest. In habit, *Disoon* and *Nesogenes* are said scarcely to resemble Myoporaceous plants. Many points of analogy between these genera and *Sclerophylax* are deserving of attention. The genus last mentioned has a tubular corolla, the segments of which have an involuted æstivation, as in *Disoon*; five stamens, one of which is smaller; a superior bilocular ovarium, with a single suspended ovule in each cell; the fruit is an indehiscent 2-celled carcerule, enclosed in the augmented calyx, with a single suspended seed in each cell, the somewhat terete embryo being enclosed in albumen with a

small superior radicle. It differs, however, in the form of the anthers and the peculiar growth of the calyx in fruit. We must not forget, too, the analogy existing between *Disoon* and the *Selaginaceæ*, in their hippocrepiform 1-locular anthers, their didynamous stamens, and the structure of the ovary, fruit and seed. These genera, for the reasons above given, are probably more allied to the *Scrophulariaceæ* than to the *Verbenaceæ*. Mr. Bentham's view is probably well-founded, that the true *Myoporaceæ* do not differ ordinally from the *Verbenaceæ*, which is confirmed by the occasional presence of albumen, as I have observed, in the seeds of the latter family.

Another novel point of structure in the *Duboisieæ* is worthy of our consideration. The placentæ are adnate to the base of the simple dissepiment, the upper portion of which is membranaceous and marked by a thickened nervure, where, as the ovary enlarges, this part becomes split and separated into two lateral portions, attached respectively to the opposite walls of the pericarp: consequently both the berry of *Duboisia* and the capsules of *Anthocercis*, *Cyphanthera* and *Anthotroche* are incompletely bilocular in the summit, and the dissepiment becomes more or less lunulate, as occurs in several genera of the *Goodeniaceæ*. Another fact, at the same time, should be remembered, the great approach in the character of the æstivation of the corolla among the *Duboisieæ*, to that existing in the *Goodeniaceæ*.

There is little to add to the observations already made upon the structure of this genus, except to indicate an error in its generic character, as given in the 'Prodromus' (DC. x. 191), where the radicle is said to point to the basilar hilum: this is an oversight; the radicle certainly points to the base of the seed; but the hilum, as in *Anthocercis* and its congeners, is seen upon the ventral face, a little below the middle, in the sinus of its slight curvature. Mr. Bentham there points to an error in Endlicher's interpretation of Bauer's analysis above referred to, wherein the seed is mistaken for the placenta, and a tubercle of the seed for the seed itself: whatever may have been Bauer's intention, I can confirm the truth of the above remarks from my own observation, with this difference, that the areolæ represented in the plate, and said to be tubercular rugosities, are in fact deep hollows. The mode of its inflorescence is very peculiar, and similar to that of *Cyphanthera*.

The following designation of its generic features will be found to be more in accordance with the facts just enumerated:—

Duboisia, R. Br. Prodr. 448; Endl. Gen. n. 3906; DC. Prodr. x. 191.—Char. emendat.—*Calyx* parvus, campanulatus, æqualiter et breviter 5-dentatus, mox corollæ incremento sæpe

fissus, et tunc sub-bilabiatus, persistens. *Corolla* late tubulosa, tubo superne vix ampliore, imo supra basin demum circumscisso, limbi laciniis 5, oblongis, obtusiusculis, tubo 4to brevioribus, patentibus, nervosis. *Stamina* 4, inclusa, didynama, cum rudimento quinti inter 2 longiora; *filamenta* paullo supra basin tubi inserta, hinc geniculata et dilatata, superne linearia, 2 majora tubo dimidio, 2 minora tubo 4to breviora, apice recurva; *antheræ* extrorsæ (iis *Anthotrochidis* similes). *Ovarium* ovatum, corollæ tubi reliquo imo indutum, 2-loculare; *ovula* pauca, dissepimento utrinque placentifero adnata, adscendentia. *Stylus* filiformis, brevis, apice declinatus. *Stigma* clavatum, 2-lobum. *Bacca* parva, globosa, vel ovata, calyce immutato fisso suffulta, 2-locularis. *Semina* pauca perfecta (6–8), adscendentia, oblongo-cylindrica, incurva, ad dissepimentum subtenue superne incompletum utrinque adnata; *testa* crustacea, foveis magnis scrobiculata, *hilo* paullo infra medium in sinu ventrali; *embryo* in *albumine* teres, subincurvus, *cotyledonibus* brevissimis, *radicula* infera basi spectante et ut in *Anthocercide* hilo evitante.—Arbuscula *Novæ Hollandiæ*; folia *alterna, lanceolato-oblonga, glaberrima, integra*; paniculæ *ex axillis ramulorum novorum iterumque conjugatim brachiatæ, brachiis* (*uno sæpe abortivo*) *utrinque e nodis geminatis cupularibus bracteatis ortis,* bracteis *cito caducis,* pedicello *terminali semper inter cupulas ultimas surrecto*; flores *parvi, pedicellati, cærulescentes*; baccæ *parvæ, nigræ.*

1. *Duboisia myoporoides,* R. Br. *loc. cit.*; Endl. Iconogr. tab. 77; DC. Prodr. *loc. cit.*—Notelæa ligustrina, *Sieb. Fl. Nov. Holl. Exs.* 259. *non Vent.*;—omnino glabra, foliis lanceolato-oblongis, obtusiusculis, e medio in petiolum elongatum gracilem sulcatum gradatim angustatis, utrinque concoloribus, crassiusculis, nervis plurimis immersis parallelo-divergentibus intra marginem conjunctim arcuatis; ramulis floriferis, brevibus, erectiusculis; fructiferis demum valde elongatis, et tunc quam folio magis deflexis, horizontaliter patentibus: pedicellis solitariis, in dichotomiis paniculæ terminalibus, brevibus: baccis pisominoribus, nigris, calyce fisso suffultis.—Novæ Hollandiæ ora orientali.—*v. s. in herb. Hook., Nov. Holl.* (Sieber), *River Hastings* (Fraser), *Port Macquarie* (Backhouse), *Sydney* (hort. bot. cult.).—*In herb. Heward, Illawarra* (A. Cunningham).

Bauer's figure, above referred to, gives an excellent representation of this plant when in fruit: at first, however, the younger flowering shoots assume the appearance of very branching panicles, the lower ramifications being alternate, the upper ones opposite and dichotomously branching, with a single flower in

the intervals; they are about 3 inches long, but when the fruit becomes ripened, they attain a length of 6 or 10 inches, and are much more deflexed than the axillary leaf from which they spring: most of the bracts fall away, but others, especially the lower ones, grow ultimately into leaves: the pedicels are 2 lines long in flower, and 3 lines in fruit; the calyx is $\frac{3}{4}$ line long; the corolla 2 lines in length, and is said to be of a bluish lilac colour: it flowers in October: the berry is $1\frac{1}{2}$ line in diameter*.

Concluding Remarks on the Solanaceæ.

It is now (October 1852) more than two years since I suspended my observations on the *Solanaceæ*, in expectation of the long promised monograph of M. Dunal, which has at length made its appearance in the 13th volume of the 'Prodromus' of M. De-Candolle. Several of the genera belonging to this family, as well as most of the species that I have enumerated at different intervals, are there recorded; but as their respective affinities, their distribution founded on peculiar features, and the differential characters of the divisions thus proposed, are not noticed in the slightest degree, I feel myself called upon to make some remarks on the subject. Considering how little was known of the real limits of the genera of the *Solanaceæ* a few years ago, aware of the confusion in which these were associated upon the most irreconcileable data, as witnessed in the latest distribution of the family in Endlicher's 'Genera Plantarum' and Don's 'Dictionary,' knowing that the species were ill-defined and ill-classified, and that a large proportion of undetermined plants were amassed in every herbarium, for want of the means of their discrimination, it was natural that a general satisfaction should be felt on the announcement, that M. Dunal was occupied in elaborating a monograph of the family for the 'Prodromus.' This ought, in regular order, to have preceded the *Scrophulariaceæ*, and to have appeared seven years ago: the intervening delay has therefore served only to increase a general anticipation of greater perfection in a work, proceeding from the hand of one who had written on the genera of the family and their affinities thirty-five years since, and who had made this order an object of his study during a great portion of his life. It cannot be concealed that its appearance has not answered the universal expectation, and that a feeling of disappointment has been generally felt among botanists on its perusal. All will unite in their acknowledgement to M. Dunal for the production of this laborious work, and will willingly excuse a large share of its imperfections, when

* Analytical details of this species are given in a supplementary plate, at the end of this volume.

it is known, that in his anxious endeavours to bring it to a close, he has laboured beyond his physical powers, persevering in this task under the pressure of long and continued illness. Still it is to be regretted, that circumstances should have operated to keep its distinguished author in ignorance of the facts and reasonings that have been published within the last few years. If, therefore, I now proceed to point out several inconsistencies in the distribution exhibited in this volume, I can truly affirm, that it is not from any desire to criticize the labours of M. Dunal, but to justify what is due to the advancement of science, and to support the inferences drawn and the facts collected by me towards the history of this family.

The great object of all scientific arrangement is to group together individuals possessing some common conspicuous features, by which they may be readily distinguished: these may again be subdivided by other partial characters into sections and subsections, but all such characters should be clearly definable.

The ordinal character of the *Solanaceæ*, as given by M. Dunal, like that of his predecessors, falls very far short of this desideratum, and the Conspectus of the classification is deficient of those tangible features that should serve the purpose of discrimination. Its limits are by far too general, embracing within its scope individuals belonging to other orders. In the character of the corolla, for instance, the more important features are neglected or merely hinted at, while others more especially selected are frequent among *Scrophulariaceæ* and other orders: hence they are of little value for distinguishing the precise family to which species belong. In the characters given of the structure of the seed and embryo, many peculiarities are altogether omitted, while others are inaccurately described: these will be more particularly noticed presently. In his Conspectus, M. Dunal divides the family into two tribes, the *Nolaneæ* and the *Solaneæ*, the latter being separated into nine subtribes, which are marked by very insufficient characters, as I shall hereafter explain. Of these subtribes the most numerous in genera is the *Solaneæ*, signalized by three principal features; 1. a regular corolla, an indication of little utility, as it exists equally in other tribes; 2. a bilocular berry; 3. a semicircular or spiral embryo, a feature also retained by other subtribes, and even here too its applicability as a test is rendered nugatory by the knowledge that *Juanulloa* and *Marckea* have a nearly straight embryo.

It is to be regretted that M. Dunal should have associated the *Nolanaceæ* with the *Solanaceæ*, from which they differ essentially in the structure of the pistil and the fruit. The *Scrophulariaceæ*, *Atropaceæ* and *Solanaceæ*, placed as I have suggested under more strictly defined and simple limits, form, together with some other

families, a very manifest alliance, exhibiting the prominent characteristics of monopetalous flowers, with a pistillum consisting of a superior ovarium, a simple style, and a stigma generally entire or 2-lobed; the ovarium by the confluence of its carpels being normally 2-locular, with the cells placed always anteriorly and posteriorly in regard to the axis; and whenever the few known exceptions occur of more than two cells, these will be found to arise generally from an unusual extension of the placentæ, which always proceeding from the centre of the dissepiment, produce abnormally other spurious cells. Among the *Nolanaceæ*, the only genus that approaches this definition is *Grabowskya*, all others differing essentially in structure, but even in that genus the resemblance is more apparent than real. In the *Nolanaceæ*, the carpels constituting the pistillum are more numerous, and, excepting the case just mentioned, are always free, springing from a fleshy receptacle surrounded by distinct glands, and all receiving their fertilizing influence through the medium of one common style, that has no direct communication with the ovaria, but always indirectly, through the intermedium of a supporting gynobase, in the same manner as the *Borraginaceæ* and the *Labiatæ*. In *Grabowskya*, although the two component carpels are connate, the style apparently issuing from it does not spring from the summit, as in an ordinary pistillum, but may be traced down the axile line of their union to the base, and may be separated from the adherent carpels: the style therefore, though concealed below by the confluent carpels, is truly of gynobasic insertion. This essential difference in the structure of the pistil renders the union of the *Solanaceæ* and *Nolanaceæ* quite indefensible. Another peculiarity is constant in the *Nolanaceæ*, in which respect we find no parallel or analogy among the *Solanaceæ*: this consists in the fact, that whether the ripened nuts be unilocular or many-celled (the cells in all cases being 1-seeded), there is always seen at their basal point of attachment, one or more scars, each closing the entrance into a corresponding cell, which scar, in every case, represents the end of a kind of plug, evidently analogous to the strophiole (or Calomphala of Schrader), so conspicuous in the nuts of the *Borraginaceæ*. Another distinction will also be found to exist which has not been noticed by M. Dunal: in the *Solanaceæ* the extremity of the radicle never points immediately to the hilum, but is directed to a spot removed from it, and even where the embryo is straight, as in *Metternichia*, *Cestrum*, *Fabiana*, &c., although the end of the radicle points to the bottom of the seed, the hilum is always lateral or marginal, at some little distance from the base: in *Nolanaceæ*, on the contrary, the extremity of the radicle always points to the strophiolar cavity in the base of the

nut, and of course to the hilum, or place of its attachment to the gynobase. This forms another essential and constant difference between the two families. There is still one more material distinction in the structure of the pistillum arising out of the circumstances just mentioned. In the *Solanaceæ*, we always meet with numerous ovules in each cell, all attached to the placentæ springing from the dissepiment; in the *Nolanaceæ*, a single ovule only exists in each cell, and this is constantly erect and of basal origin.

Schlechtendal in 1832 (Linnæa, vii. 72) pointed out the analogy that exists in the genus *Nolana* to the families of the *Borraginaceæ* and *Solanaceæ*, admitting its greater affinity with the former, on account of the structure of its fruit and the æstivation of its corolla; but as a justification for those who might prefer placing it in *Solanaceæ*, it was argued by that able botanist, if the genus *Lycium*, which differs from other genera of this last-mentioned family in the æstivation of its corolla (the only exceptional case at that time known), be retained in this order, then there would be less difficulty in admitting *Nolana*, notwithstanding the very different structure of its fruit. Dr. Lindley, who first proposed this order in 1833, placed it near the *Convolvulaceæ*. G. Don (1837) was I believe the first who decidedly associated the *Nolanaceæ* as a tribe of the *Solanaceæ* (Dict. iv. 399), but he offered no reasons for this union. Endlicher in his 'Genera Plantarum' followed the views of Dr. Lindley, in attaching this group as a suborder of the *Convolvulaceæ*. Brongniart (1843) adopted the same views in regard to the affinity of the *Nolanaceæ*. A. de Jussieu (1844, Cours Elémentaire) equally confirmed the ideas of the before-mentioned botanists, in placing the *Nolanaceæ* in contiguity with the *Dichondreæ*, between the *Borraginaceæ* and *Convolvulaceæ*. In 1845 I adduced many facts and several additional reasons, why the *Nolanaceæ* should be placed in the system following the *Borraginaceæ* (*Lo. Jo. Bot.* iv. 366 *et huj. op.* i. 46), which position was confirmed in the following year under the arrangement given by Prof. Lindley (Veg. Kingd. 654), where this order is placed in his Echial alliance with the *Borraginaceæ*, *Labiatæ* and others. The views of so experienced a botanist as M. Dunal must ever be received with respect, and will claim support from the mere prestige of his name, as well as from the high reputation of the great work to which he has contributed this important monograph; but we may be allowed to doubt the propriety of his determination, in placing the *Nolanaceæ*, as a tribe of the *Solanaceæ*, without refuting the reasons urged by so many botanists against the justness of this arrangement, or offering any arguments in favour of such an alliance. This classification may have originated in the too eager desire

entertained by M. Dunal, in common with many botanists, to diminish as much as possible the number of natural orders, a very proper and meritorious caution, but when carried to excess, as in this instance, is productive of mischief; for by uniting several families into one, which are composed of very opposite and dissimilar characters, we destroy the very object we attempt to establish, viz. to mark the limits of distinction between different groups of plants. The selection of a few decided and constant characters, that can serve to distinguish each order, tribe or section, must infallibly tend to the greatest simplicity of arrangement; and if in accomplishing this purpose, we should thus be led to increase the number of families, in order to ensure the means of certain discrimination, it is indubitably better to do so, rather than, by pursuing the opposite extreme, to render all fixed landmarks useless. It was upon this conviction that I proposed (*huj. op.* i. 163) to reduce the *Scrophulariaceæ* within more certain limits than Mr. Bentham had employed in his admirable monograph of the order in the 10th volume of the 'Prodromus' of M. DeCandolle, and also to confine the *Solanaceæ* within strictly definable bounds. The difficulty of establishing an obvious line of demarcation between these two great families, was there discussed at some length, when I showed how unsuccessful had been the attempts of botanists to remedy so manifest a defect in the system. Mr. Bentham, it is true, adopted with this view, the plan of associating the few aberrant cases then known, in a distinct tribe, his *Salpiglossideæ*: the heterogeneous features of that tribe have been fully demonstrated, proving that the attempted remedy has been wholly inefficacious: among the many instances that could be cited, it is only necessary to point out, how impossible it is to retain *Salpiglossis, Anthocercis, Schwenkia* and others in *Scrophulariaceæ*, while *Petunia, Nierembergia*, and numerous others are placed in *Solanaceæ*. At the time of Mr. Bentham's monograph the exceptional genera were few, but since that period they have become so multiplied as to equal in number those belonging to true *Solanaceæ*.

As a desirable test towards the attainment of this great desideratum, I suggested the constant character of the æstivation of the corolla, which, combined with other well-selected features, will be found to reduce these two extensive orders within definable bounds: for this purpose, it is only requisite to detach from each their several aberrant cases, and comprise these in an intermediate family, where they are easily separable into tribes, distinguishable by marked peculiarities. M. Dunal does not seem to have been aware of this suggestion, or at least, no such expedient appears to have entered into his contemplation; and his ordinal diagnosis of the *Solanaceæ*, aggravated still further by

the inclusion of the *Nolanaceæ*, is necessarily a combination of contradictory characters, repeating and increasing all the defects of his predecessors.

I will here recapitulate the more essential points suggested on a former occasion, when upon the principle then recommended, the Solanal alliance, excluding entirely the *Nolanaceæ*, but including the *Scrophulariaceæ*, will consist of individuals, marked by the leading characters there enumerated (*huj. op.* i. 166.). Among these, the *Solanaceæ* will embrace those genera with a monopetalous corolla, having a 5-, rarely 4-partite border, the lobes of which (even under the unusual circumstance of the tube being oblique) are nearly regular and equal, and their margins always valvate or induplicato-valvate in æstivation : epipetalous stamens, alternate with, and equal to the number of the lobes, sometimes unequal in length and size, and the fifth very rarely sterile ; anthers introrse, bursting by longitudinal slits or apical pores ; an ovarium most generally 2-celled, rarely 3- to 5-locular, with a simple style and a 2-lobed or clavate stigma, often hollow ; a fruit either capsular or baccate, 2-locular, rarely more-celled from the increment of the placentæ, albuminous seeds with an embryo, in the suborder *Curvembryeæ*, always slender, terete, and curved in a more or less annular or spiral form, in the suborder *Rectembryeæ*, short and straight, the radicle in all cases pointing, not to the base, but to the basal angle of the seed, and turned away to some short distance from the hilum, which is generally lateral and somewhat marginal, but never basal. They consist of plants, with alternate, often geminate, rarely pinnatifid leaves, with an inflorescence sometimes axillary, but more generally a little extra-axillary, or lateral, either single or fasciculated, or in different modifications of the cyme, panicle or corymb, under a mode of development called centrifugal.

The *Scrophulariaceæ* will consist of those genera, possessing a tubular corolla, more or less curved and irregular, with a 4- or 5-partite border, the lobes of which are generally unequal and bilabiate, and decidedly imbricate, never valvate, in æstivation ; stamens two or four, didynamous, rarely five, or with a rudimentary fifth ; anthers always introrse ; an ovarium most generally bilocular, a simple style, with a stigma more or less bilabiate or 2-lobed ; fruit almost always capsular, in a very few cases baccate, 2-locular, rarely more-celled, bursting in different ways, with placentæ proceeding from the dissepiment. Seeds albuminous, with an embryo quite straight, or but little curved, generally with the radicle pointed towards a basal hilum : in one solitary instance the embryo is perispherically curved, and in the *Rhinantheæ*, by an abnormal extension of the podosperm ; the hilum appears somewhat lateral. In this very natural family,

although the floral leaves are often alternate, the cauline leaves are most generally opposite, a circumstance that occurs only accidentally in *Solanaceæ*: the inflorescence is strictly axillary*.

The *Atropaceæ* will comprise all the anomalous exceptions to the foregoing rules in the *Solanaceæ* and *Scrophulariaceæ*, and will include plants with monopetalous flowers, with the tube often plicated longitudinally in bud, and a border often somewhat unequal, but seldom bilabiate, generally divided into five lobes, which are always either imbricately disposed in æstivation, or arranged under some modification between that form and the induplicate, but never valvate, the margins of each lobe being constantly free from the adjoining ones: they have generally five epipetalous fertile stamens, alternate with the lobes, one of them sometimes shorter, and very rarely three of them sterile: anthers generally introrse, sometimes extrorse, 2-lobed, usually with parallel cells bursting longitudinally, one of the lobes being occasionally sterile: ovarium 2-locular, rarely, with other spurious cells, caused by the abnormal growth of the placentæ, with ovules generally ascending, attached to fleshy placentæ adnate to the dissepiment, as in the two preceding families, a simple style, a bilobed stigma, often of a peculiar form: fruit either baccate or capsular: seeds generally reniform and compressed, with a lateral hilum, the embryo placed in albumen, and either straight or more or less curved, sometimes spiral, with the radicle, as in the *Solanaceæ*, always turned away from the more lateral hilum. Herbaceous plants or shrubs, with a habit similar to that of the *Solanaceæ*, with alternate, simple, geminate, or fasciculate leaves: inflorescence generally somewhat extra-axillary, and lateral in regard to the insertion of the petiole.

The distribution of the *Solanaceæ* and of the *Atropaceæ*, as proposed in this work (*huj. op.* i. 164–178), like every first attempt of the kind, is sure to present many faults that will admit of correction, but it appears deserving of the attention of botanists as a general plan: it certainly effects the great desideratum of removing the obstacles that have always stood in the way of a satisfactory arrangement of the Solanal alliance, and it separates the genera into very natural groups, which we do not meet with in the system adopted by M. Dunal. Some observations

* The efficacy of this test may be applied to *Verbascum*, a genus of the *Scrophulariaceæ*, which offers so many anomalous characters, as to have induced many botanists to place it in *Solanaceæ*. On a former occasion I discussed this subject at some length (*huj. op.* i. 181), when reasons were shown why a preponderance tended towards its position among the *Scrophulariaceæ* as determined by Mr. Bentham: to these I may now add the fact of the structure of the seed, in which the radicle of its straight embryo is directed towards its basal hilum.

on the peculiar features of each of these groups will be found in the pages referred to.

I now proceed to review in succession the value of the characters selected as the discriminating marks of the subtribes, in the arrangement followed by M. Dunal. There does not appear to me sufficient reason for separating the genus *Triguera* as a subtribe distinct from the *Solaneæ*. It is certainly a well-marked genus, possessing prominent characters, and differs only from the other genera of the latter subtribe in the slightly oblique form of its bell-shaped corolla; but, like others of the *Solaneæ*, its border has five equal and regular lobes, and agrees with them in æstivation; it has also five equal stamens, supported on a ring, as in *Cyphomandra*, but this ring is more free from the tube of the corolla; its anthers open by apical pores, as well as by lateral slits, as in some sections of *Solanum*; in the structure of the ovarium, its style and stigma, in its fruit, its placentation, its seed, and its embryo, there is nothing different from what we frequently meet with in *Solanum* itself. M. Dunal, on the authority of Cavanilles, states the fruit to be 4-locular, each cell producing only two seeds, which are superimposed. I found the fruit to be distinctly 2-locular, being divided by a single membranaceous dissepiment, with two or three seeds in each cell, fixed, as in *Solanum*, to fleshy placentæ adnate to the dissepiment. The seeds are reniform, compressed, large in proportion to the size of the fruit; but their paucity in each cell is a test of no value, for I found in *Withania* only a solitary seed perfected in each cell. There is not therefore a single character in *Triguera*, except the small obliquity of the tube of the corolla, that is not met with in other genera of the *Solaneæ**.

Among the subtribes *Solaneæ* and *Atropineæ* of M. Dunal, we find genera placed heterogeneously together, without regard to uniformity of character, and totally irrespective of the most important feature of æstivation. Thus, among the *Solaneæ*, which possess a valvate æstivation, is placed the genus *Nicandra*, with a corolla resembling that of a *Convolvulus*, the lobes of its border possessing a decidedly imbricated æstivation. The want of attention to this last-mentioned important character has, in the same manner, led to the confused association of several genuine sections: thus, among the *Atropineæ*, we find the very natural group of the *Jaboroseæ*, distinguished by a tubular corolla, which

* I have observed in several other cases an equal degree of obliquity in the corolla. Among these may be instanced *Hyoscyamus pictus*, where it is quite as oblique and gibbous as in *Triguera*: the same fact is depicted in the plate given of *Hyoscyamus niger*, in Nees's Gen. Pl. Fl. Germ. figs. 5, 6 and 7.

in most cases grows black in drying, always possessing a valvate æstivation and other very distinct characters, classed with *Atropa* and *Mandragora*, genera quite different from them and each other, and possessing a remarkably imbricate æstivation. Thus also in the *Lycineæ*, there is an equal amount of complication, for we see *Dunalia*, *Iochroma*, *Pœcilochroma*, *Acnistus*, and others with valvate æstivation, associated with several distinct groups that possess an imbricated æstivation: among these we find *Juanulloa*, *Solandra*, &c., and also *Marckea*, *Thinogeton*, &c., and all these again congregated with *Lycium*—groups perfectly distinct from one another. We meet with *Juanulloa* and *Marckea*, having almost a straight embryo, placed among a number of genera having a nearly annular embryo.

The genus *Thinogeton*, arranged by M. Dunal among his *Lycineæ*, is said to be closely allied to *Jaborosa*, *Himeranthus*, *Dorystigma* and *Trechonætes*, genera which he has singularly placed among his *Atropineæ*. This distinguished botanist can never have seen a specimen or drawing of *Thinogeton*, or he would never have ventured on such a conclusion: its affinity, as I have elsewhere shown, is toward *Scopolia*, *Physochlæna* and *Cacabus*, genera that I have placed with *Hyoscyamus*, on account of their many uniform characters, particularly that of the operculiform dehiscence of their fruit.

In M. Dunal's tribe of the *Datureæ*, we meet with a similar degree of irregularity, in the association of perfectly incompatible genera. Thus *Dictyocalyx* is placed here, while *Thinogeton* is arranged among the *Lycineæ*, and yet these two genera are identically the same. This genus with a spiral embryo, and *Datura* with a nearly annular embryo, are associated with *Solandra*, where the embryo is nearly straight or but slightly curved; in this respect M. Dunal has followed the example of older botanists, who, for no other reason that we can imagine, drew this conclusion, because in former times *Solandra grandiflora* was the *Datura scandens* of Plumier. *Solandra* is as totally distinct in habit from *Datura* as it is in structure; it is a climbing plant, with large coriaceous leaves and orange-coloured flowers of large size, with a thick fleshy corolla, having a ventricose funnel-shaped tube, and a border of five large fleshy lobes, which in æstivation are so deeply imbricated that they completely overlap one another. In *Datura*, on the contrary, the corolla is white or of a lurid blue, with a nearly entire or pentangular border; this in æstivation is plicated into five deep folds, which almost meet in the axis, and these folds are torsively and spirally twisted round the common centre, having their margins thus valvately coherent in juxtaposition: no two cases of more extreme difference could have been selected. On account of the

very dissimilar æstivation of the corolla and other distinct features, the separation of *Solandra viridiflora* from this genus, as proposed by me under the name of *Dyssochroma*, has been acknowledged by M. A. DeCandolle in the Appendix (Prod. xiii. 689), although they are combined together in the body of the work. *Ectozoma* also, having a corolla with an imbricated æstivation, and which I have shown to be allied to *Juanulloa*, is also placed among the *Datureæ*, but for what reason is not explained: it has not the smallest relation with *Datura*. I shall at some future time conclude the remarks I have to make on *Datura* and the genera allied to it, which I consider distinct, but which M. Dunal regards as mere sectional divisions of that genus.

Many objections may be made to M. Dunal's subtribe of *Hyoscyameæ*, formed only of the genera *Hyoscyamus* and *Scopolia*: this subtribe I have excluded from true *Solanaceæ* on account of the decided æstivation of the corolla. In the generic character of *Hyoscyamus*, this feature is represented as being plicated, not imbricated, and the description of the mode of placentation is quite at variance with my own observation; indeed the entire generic character given in the 'Prodromus' (p. 546), is a copy, verbatim, from the text of Dr. Putterlich in 'Nees's Gen. Pl. Flor. Germ.' In another place (*huj. vol. App.* p. 10) I have shown that this description does not accord with the very clear and analytical details exhibited in the accompanying plate: the æstivation of the border, said to be plicate, is distinctly delineated as being quincuncially imbricate in figs. 3. and 21, and there is no indication of any plicature of the border in any of the other several figures of the corolla: the placentæ are stated in the text of that work, and of the 'Prodromus,' to be inserted on the dissepiment by a linear dorsal line, while the figures 19. and 28. exhibit broad lunated placentæ projecting into the cell, connected with a short membrane that emanates from the axis of the dissepiment: I find neither of these statements to accord with what I have seen in *Hyoscyamus pictus*, of which species I have examined scores of ovaria and capsules, in a living state, where I have invariably found the placentæ to be thick and fleshy, and completely adnate to the dissepiment. I have also, in the work above referred to, directed attention to the striking, fleshy, epigynous gland, which has been quite unnoticed by preceding observers, and it is singular that so remarkable a feature should have been omitted in the 'Prodromus.' The genus *Scopolia*, as enlarged by M. Dunal, is divided into four sections, *Datora*, *Physochlæna*, *Anisodus* and *Scopolia*, groups which appear to me all generically distinct. *Datora* evidently belongs to *Hyoscyamus* rather than to this genus. In *Scopolia*, judging from the plants I have seen growing in Kew Gardens, the inflo-

rescence is always solitary, a single flower upon a long slender peduncle springing from between the two petioles of the geminate leaves of each distant axillary node of the main stem, and this feature is confirmed in the description of the same species by M. Dunal (Prodr. p. 556). Dr. Putterlich, however, in stating the inflorescence to be solitary and pseudo-axillary, adds that in reality it is terminal, from the centrifugal evolution of its 2–3-chotomous stem; I confess that I have been unable to distinguish this character: its calyx is urceolate, membranaceous, and regularly 5-toothed: the corolla has a somewhat broad, bell-shaped, almost cylindrical tube, with five very short erect lobes; and although the tube is plicated, the lobes are distinctly imbricated in æstivation: this last feature is acknowledged by Dr. Putterlich, but unnoticed by M. Dunal: the ovarium, at its base, is imbedded in an adnate, fleshy, 5-lobed disk, a character existing also in *Hyoscyamus* and its several allied genera: the capsule, invested by its thin persistent calyx, bursts by a small membranaceous, circumscissile operculum. In *Datora*, the type of which is the *Hyoscyamus muticus*, Linn., the inflorescence is described as "floribus apice ramorum racemoso-spicatis" as in *Hyoscyamus*: the calyx in like manner is tubular, 10-ribbed, with five long aciculate teeth; this also increases with the growth of the fruit, becomes rigid in texture, but more ventricose, while the withering teeth collapse and cover the inclosed capsule, instead of remaining erect and spinose: the corolla and stamens differ in no respect from those of *Hyoscyamus*: the operculum of the fruit is, in like manner, hard and hemispherical, with a chartaceous septum; indeed I cannot perceive from the descriptions, any single character different from that genus, except that the calyx becomes more ventricose, and the teeth, instead of remaining erect and rigid, collapse and wither over the enclosed capsule: there is nothing here, however, to justify its being placed in *Scopolia*: I am not sufficiently acquainted with the plants of this section to offer a decided opinion; but if it really differ generically from *Hyoscyamus*, it must remain a distinct genus (perhaps *Secarana*, from its Arabic name, for *Datora* is too near *Datura* to be permitted); but it appears to me far better to class the three species enumerated by M. Dunal as a mere section either of *Hyoscyamus* or of *Physochlæna*, as I have suggested (*huj. vol. App.* p. 15).

In regard to *Physochlæna*, many reasons have been offered (*huj. vol. App.* p. 11) to show why it must be considered as a distinct genus: it cannot belong to *Scopolia*, its affinity being much stronger towards *Hyoscyamus*, especially the section last mentioned, on account of the character of its inflorescence, its tubular calyx, and its shorter and more campanulate corolla.

Anisodus, however, is so extremely different in all its characters,

that it offers still less reason for being retained in *Scopolia*. The latter has a membranaceous urceolate calyx, one-third or one-fourth the length of the corolla, which is tubular or slightly funnel-shaped, thin in texture, with a border of five very short lobes, slightly imbricated in æstivation. In *Anisodus*, on the contrary, the calyx is extremely thick and fleshy in texture, broad, tubular, and somewhat ventricose, with ten thick, prominent nervures, and five obtuse teeth: this does not much enlarge, but it grows thick and rigid, assumes a very reticulated or cancellated appearance, and encloses the large oval berry, when its ten prominent thick nervures become ligneous; the corolla does not much exceed the calyx in length, is thick and fleshy in substance, broadly campanulate, with a border of five large rounded lobes, which overlap one another at base, and are deeply imbricated in æstivation, one lobe being larger and more interior than the others. In *Scopolia* the testa is tuberculosely rugous, in *Anisodus* it is smooth and slightly punctulated: in the former genus the stigma is capitate and obsoletely 2-lobed, the external surface being covered with short articulated hairs or papillæ; in the latter genus it is somewhat compressed and distinctly bilobed, with a simply rugous stigmatic surface: in *Scopolia*, the corolla is quite glabrous on both sides, as are also the filaments; in *Anisodus*, the inner surface is quite woolly, and the filaments are pubescent when in bud; in the former the fruit is quite capsular, thin in texture, 5-grooved with a torulose surface; its operculum is simple, soon falls off, and its seeds are affixed on an inconspicuous adnate placenta, attached to the dissepiment; in the latter genus the fruit is oval, smooth and thick, with a fleshy epicarp that hardens on the pericarp like an exsuccous berry, and the operculum only manifests itself after the decay of the dry fleshy covering; the seeds are aggregated upon a very large, globose, carnose, favose placenta, adnate to the dissepiment, and are half imbedded in its fleshy substance. In fine, there are more manifest generic distinctions between *Scopolia* and *Anisodus*, than between *Scopolia* and *Hyoscyamus*. In my enumeration of the genera composing my tribe *Hyoscyameæ* (*huj. op.* i. p. 166), *Anisodus* was not included, because I had not then observed the operculiform dehiscence of its fruit, a character that had not been previously recorded by any observer; but I rectified this subsequently (*huj. vol. App.* p. 17).

M. Dunal's tribe of the *Nicotianeæ* consists of the genera *Nicotiana*, *Lehmannia*, *Petunia*, *Leptophragma* and *Vestia*: the latter genus certainly bears no affinity towards the others: it was placed by me upon more solid grounds near *Fabiana*, in the true *Solanaceæ*, because of the valvate æstivation of its corolla, and of the resemblance in the structure of its fruit and seed:

the other genera, by reason of the imbricate æstivation of the corolla, were placed by me in *Atropaceæ*, but the *Nicotianeæ* were kept as a tribe, distinct from the *Petunieæ*, because of the peculiar mode of æstivation of the corolla, of which diagrams were given in explanation (*huj. op.* i. p. 173). The genus *Leptophragma* (Prodr. xiii. 578), founded on the *Salpiglossis prostrata*, Hook. & Arn., will not be found to be valid. In March 1846, I first hinted at the possibility that *Callibrachoa* would not be found to be distinct from *Petunia*, on which Mr. Bentham immediately suggested that both *Callibrachoa procumbens* and *Salpiglossis prostrata* would in all likelihood prove to be identical with my *Petunia anomala* (see note April 1846, Lond. Journ. Bot. v. 190). It will be seen from another note published in Feb. 1848 (*huj. op.* vol. i. p. 114), that having met with an opportunity of examining specimens of the two first-mentioned plants, I had found them to differ in no respect from *Petunia parviflora*, of which I have given a drawing, with ample analytical details, in plate 23. of the volume referred to : I showed also that it is identical with the *Lindernia Montevidensis*, Spr. The genus *Leptophragma*, now first established by M. Dunal upon a letter from Mr. Bentham of an old date, cannot therefore be retained, and *Leptophragma prostrata*, Benth., can only be considered as another synonym of *Petunia parviflora*, Juss., a plant that appears to have a widely extended range over the American hemisphere.

I have already offered several observations on the genus *Retzia* (*huj. op.* i. p. 181), with which M. DeCandolle, on the authority of M. Dunal, classes *Lonchostoma*, Wikstr. To this I cannot accede, for neither the habit of the plant, nor the structure of the flower, bears any analogy towards the *Solanaceæ*. On some future occasion I will furnish the results of my analysis of these two genera, when I will offer a few additional remarks on the subject.

M. Dunal, in his subtribe *Fabianeæ*, has in an equal degree overlooked the character of æstivation, which is one of the most important and constant features of the genera of the Solanal alliance. This subtribe is made to consist of *Nierembergia*, *Bouchetia* and *Fabiana*. The latter genus only I consider to belong to *Solanaceæ*, on account of the valvate æstivation of its corolla. Of *Nierembergia* I have given several illustrations and copious analytical details, where the peculiar character of its æstivation has been fully shown. The genus *Bouchetia*, DC., now first published by M. Dunal, does not appear from the characters described (Prodr. 589) to differ in any respect from *Nierembergia*, and especially from *N. linifolia* and *anomala*, which are figured in plate 20 of this work, and where the tube

of the corolla is a little more swollen towards the summit, and the lobes of the border smaller than usual, as in the genus in question: in the latter species the insertion of the stamens is even lower than in *Bouchetia*.

Of the eleven species of *Fabiana* enumerated by M. Dunal, it is evident from the characters given that the five first mentioned only belong to the genus. *F. grandiflora* is probably one of the singular species of *Alona* (possibly *A. rostrata*) described by Prof. Lindley, or it may be a plant closely allied to, if not identical with, *Phrodus Bridgesii* (*huj. vol.* p. 25, tab. 41). *F. squamuligera* is probably *Phrodus nodosus* (*loc. cit.* tab. 42 B). *F. thymifolia*, *F. Sellowiana* and *F. heterophylla*, none of which I have seen, appear, from the descriptions given of them, to belong to *Petunia*, as Dr. Sendtner has also concluded (Flor. Bras. part 6. pp. 175, 176).

Under *Cestrum*, M. Dunal considers *Habrothamnus* merely as a section of that genus, but in his 'Conspectus' he places them as distinct genera. For a long while I was doubtful on the subject; but on a more careful examination of living plants, an essential difference was found to exist in the floral structure, which was indicated by their habit: these differences were enumerated on a former occasion (*huj. vol.* p. 79).

Having animadverted upon M. Dunal's general arrangement of the *Solanaceæ*, I now proceed to offer a few comments on some of the genera. In p. 449 we find *Cacabus* included in *Physalis*: it is nearly four years since (*huj. vol.* p. 48) I pointed out the characters by which the former differs from the latter, one of the most striking features being, that in *Cacabus* the inflorescence is fasciculated, while in *Physalis* the axillary flowers are invariably solitary. In this last-mentioned genus the calyx is at first more urceolate, 5-toothed, afterwards it becomes greatly enlarged, inflated, pentagonously globular and subreticulated: in *Cacabus* at an early stage it is tubular, inflated below by five salient saccate lobes, and narrowed towards the mouth, where it is divided into five acute segments; it is then delicately thin in texture, finely and elegantly reticulated, and afterwards increases in size, but less in proportion, when it always retains its delicate texture, form, and almost araneoid appearance. In *Physalis* the corolla is broadly and roundly campanular, generally of a yellow colour, and is either immaculate, or more usually marked with five large purple spots in its lower moiety; it is seldom more than twice the length of the calyx: in *Cacabus* the corolla is large and conspicuous, tubular, and slender at base, suddenly expanding into a funnel-shaped campanular form, with a nearly entire limb, like the flower of a *Nolana* or *Convolvulus*, being like them of a delicately pale blue, marked with five long linear

rays, each ray formed of three nearly parallel nervures; it is at least three times the length of the calyx. M. Dunal states that *Cacabus* has the habit and the corolla of *Atropa*. On this point he appears to me clearly under a mistake, for its habit is certainly more that of a *Nolana*, being a prostrate herbaceous plant, with a fleshy angular stem, and its corolla, as above shown, bears no resemblance to that of *Atropa*. One of the peculiar features which I have pointed out in this genus, is the remarkable fleshy epigynous gland, seen on the summit of the ovarium, like the same feature seen in *Thinogeton*, to which genus it closely approaches in its general habit, and in the form and colour of its flowers: there is indubitably much analogy in this peculiar feature, observable in both these genera, with the still more conspicuous fleshy enlargement of the summit of the ovarium in *Hyoscyamus*: there is nothing approaching to this structure in *Physalis*. It is for these reasons that I preferred placing *Cacabus* among the *Hyoscyameæ* next to *Thinogeton*, although I have not discovered that its fruit possesses an opercular dehiscence, nor been able to ascertain the æstivation of its corolla. M. Dunal does not appear to have been aware of these facts, but Prof. A. DeCandolle in a note of the Appendix to the 'Prodromus' (p. 690) adheres to the views of that botanist on this subject, and reverses the conclusions to which I arrived, without attempting to subvert the facts above-mentioned, or annul the reasonings founded on them: he quotes the character I published of *Cacabus nolanoides* under the name of *Physalis nolanoides*. These facts remain submitted to the judgement of botanists, and it appears to me that any one who will carefully compare the analysis given of that plant in plate 49 of these 'Illustrations' with any species of *Physalis*, will admit that it cannot possibly belong to the latter genus, and that *Cacabus* is justly entitled to claim a generic distinction. *Physalis*, indeed, possesses such well-marked features, that it seems a pity to mar its simple and prominent characteristics by combining it with a group so essentially distinct as *Cacabus*.

The ample generic character of *Witheringia*, as defined by M. Dunal (p. 402), and the details he has given from an examination of good specimens of L'Héritier's typical species, *W. solanacea*, confirm the opinion I long ago expressed in regard to this genus: these details, if carefully compared, will be seen to differ in no respect from the characters presented by most species of *Saracha* of the 'Flora Peruviana.' The reasons for this conviction were given nearly four years since (*huj. vol.* p. 1 et 21), when I considered the typical plant above-mentioned as a species of *Saracha*: to this inference I was led by its striking resemblance to another species closely allied to it, which I have

described (*huj. vol.* p. 20.) and figured in plate 39 A, under the name of *Saracha glandulosa*, the only structural difference between these species being that L'Héritier's plant is tetramerous, while all other species of *Saracha* are pentamerous. As M. Dunal considers this difference to be of no generic value, it is clear that under such circumstances the *Witheringia*, L'Hérit. (non aliorum), and *Saracha*, R. and P. (with a single species excepted), must merge into one genus, and according to the rule of priority the former will claim the precedence: in such case the species of this genus will be as follows:—

1.	Witheringia solanacea, L'Hérit.	DC. Prodr.	xiii.	402
2.	—— villosa, *nob.*	= Saracha villosa, *Don*	,,	,,	430
3.	—— contorta, *nob.*	= —— contorta, *R. & P.*	,,	,,	,,
4.	—— Zuccagniana, *nob.*	= —— Zuccagniana, *Don*	,,	,,	,,
5.	—— biflora, *nob.*	= —— biflora, *R. & P.*	,,	,,	431
6.	—— procumbens, *nob.*	= —— procumbens, *R. & P.*	,,	,,	,,
7.	—— umbellata, *nob.*	= —— umbellata, *G. Don*	,,	,,	,,
8.	—— alata, *nob.*	= —— alata, *Dun.*	,,	,,	,,
9.	—— jaltomata, *nob.*	= —— jaltomata, *Schl.*	,,	,,	432
10.	—— allogona, *nob.*	= —— allogona, *Schl.*	,,	,,	,,
11.	—— dentata, *nob.*	= —— dentata, *R. & P.*	,,	,,	,,
12.	—— viscosa, *nob.*	= —— viscosa, *Schr.*	,,	,,	433
13.	—— ciliata, *nob.*	= —— ciliata, *nob.*	,,	,,	683
14.	—— propinqua, *nob.*	= —— propinqua, *nob.*	,,	,,	,,
15.	—— diffusa, *nob.*	= —— diffusa, *nob.*	,,	,,	,,
16.	—— laxa, *nob.*	= —— laxa, *nob.*	,,	,,	,,
17.	—— auriculata, *nob.*	= —— auriculata, *nob.*	,,	,,	,,
18.	—— conspersa, *nob.*	= —— conspersa, *nob.*	,,	,,	684
19.	—— glabrata, *nob.*	= —— glabrata, *nob.*	,,	,,	,,
20.	—— acutifolia, *nob.*	= —— acutifolia, *nob.*	,,	,,	,,
21.	—— vestita, *nob.*	= —— vestita, *nob.*	,,	,,	,,
22.	—— glandulosa, *nob.*	= —— glandulosa, *nob.*	,,	,,	,,
23.	—— Candollei, *nob.*	= —— Miersii, *A. DC.*	,,	,,	,,

The *Saracha geniculata*, Mart. Gall. (Prodr. xiii. 430), should be removed from this genus and placed in *Physalis* (*P. geniculata*): this is evident from the description of its inflorescence and other characters, among which is that the berry is edible as in *P. Peruviana*.

In order to explain the ground on which my conviction of the identity of *Witheringia* and *Saracha* is founded, looking at this latter genus in the sense in which it has been hitherto understood, it may be well to observe, that a difference in the description of generic characters often results from an investigation of the flowers in a living or a dried state: thus in *Saracha* (as hitherto limited), the corolla when dried scarcely shows the fornicated origin of the filaments, the dilated bases of which in that state appear flattened, as if simply adnate to the bottom of the tube; but when these are seen in a living state, the filaments will be found to spring out of as many dilated salient glands, the mar-

gins of which often extend upward for some short distance along the tube and form conspicuous hollow cups that secrete a nectariferous juice, a corresponding furrow being often seen externally at the bottom of the tube opposite these glands; the hairy filaments spring at an angle from and are in fact an extension of the front margin of these cups, which, with the dense clothing of long cottony hairs generally seen about the base of the tube, form altogether a kind of fornix or annulus around the ovarium: the anthers are seen in a somewhat connivent group surrounding the stigma. These are precisely the distinguishing features that characterize *Witheringia*, but described in other words by M. Dunal in p. 402: this structure is indistinctly shown in L'Héritier's figure, though better explained in his description. The other features of M. Dunal's diagnosis, as respects the form of the calyx, corolla, pistillum and fruit, will be found to agree completely with those of *Saracha*, the species of which correspond in habit with L'Héritier's typical plant. It would have been better for the sake of convenience to have retained the genus *Saracha*, now so long established, for the group of plants just enumerated: this was maintained as long as a doubt hung over the real nature of L'Héritier's plant; but now that this doubt is removed, we have no alternative but to follow the course demanded by the rules of science.

Having thus removed from *Saracha* all its species, except *S. punctata*, R. & P., which in reality is the original type of this genus as instituted and figured in the Prodromus of the genera of the 'Flora Peruviana' (p. 31. tab. 34), and which I formerly separated from it in order to form the basis of a new genus (*Pœcilochroma*) (Lond. Journ. Bot. vii. 353), we are now compelled to retrace our steps, and re-establish *Saracha* for that group of plants, so that the name of *Pœcilochroma* must consequently be suppressed: the several species enumerated will now stand as follows:—

1. Saracha punctata, *R. & P.*,		instead of Pœcilochroma punctatum, *nob.*	(*l. c.*)
2. —— frondosa, *nob.*	=	—— frondosum, *nob.*	,,
3. —— guttata, *nob.*	=	—— guttatum, *nob.*	,,
4. —— maculata, *nob.*	=	—— maculatum, *nob.*	,,
5. —— Lobbiana, *nob.*	=	—— Lobbianum, *nob.*	,,
6. —— Lindeniana, *nob.*	=	—— Lindenianum, *nob.*	,,
7. —— Quitoensis, *nob.*	=	—— Quitoense, *nob.*	,,
8. —— Boissieri, *nob.*	=	—— Boissieri, *Dun.* = Lycioplesium Boissieri, *Dun.*	
9. —— Funkiana, *nob.*	=	—— Funkianum, *Dun.*	
10. — Sellowiana, *nob.*	=	Witheringia Sellowiana, *Sendtn.*	

Considering for the reasons before stated, that among the several individuals included by M. Dunal in *Witheringia*, the typical species only belongs really to that genus, it becomes ne-

cessary to indicate the proper position of the remaining species in the manner following :—

2. Witheringia macrophylla, *H. B. K.* est		Brachistus macrophyllus, *nob.* (*huj. vol.* p. 8).
3. —— Sellowiana, *Sendt.*	=	Saracha Sellowiana, *nob.*
4. —— acuminata, *Dun.*	=	Brachistus acuminatus, *nob.*
5. —— stramonifolia, *H. B. K.*	=	—— stramonifolius, *nob.* (*huj. vol.* p. 7).
6. —— lanceolata, *Dun.*	=	verisimiliter *Solani* species.
7. —— aspera, *Spr.*	=	potius *Borraginea* ut suspicat cl. Dunal.

Witheringia ciliata, H. B. K.; *W. dumetorum*, H. B. K.; *W. mollis*, H. B. K.; *W. rhomboidea*, H. B. K.; *W. riparia*, H. B. K., and *W. diversifolia*, Klotsch, referred by M. Dunal to his genus *Fregirardia*, had been long before placed by me in *Brachistus* (*huj. vol.* p. 8–13).

The *Witheringia* of Von Martius, which I had proposed to restore for a group of plants of which the type is *W. picta*, Mart., must consequently be suppressed, and we shall presently see to what genus these must now be referred. This last-mentioned plant has been oddly arranged by M. Dunal in *Withania*, for what reason it is difficult to conjecture, as it offers no analogy whatever with that genus: it is associated with other kindred species, placed by Dr. Sendtner in his genus *Athenæa*, which is made to form a distinct section of *Withania* under that name (Prodr. p. 458–459). The *Witheringia hirsuta*, Gardn. (No. 239), from Tejuca, a plant that I collected in company with that active botanist, was long ago shown by me (*huj. vol.* p. 2) to be identical with the *Witheringia picta*, Mart. (*Withania picta*, Dun. Prodr. p. 458). This same plant however is *again* referred by M. Dunal to *Bassovia* under the name of *B. Gardneri* (Prodr. p. 409). I was always struck by the strong analogy between the *Witheringia picta*, Mart., and the drawing of *Bassovia sylvestris* (Aubl. tab. 85), but in the absence of more precise evidence in regard to the latter plant the reflection was passed over, as I found this species had been referred by M. Dunal to the genus *Solanum* (Dun. Syn. 22). Now, however, that *Bassovia* has been restored by this distinguished botanist, and its characters displayed at some length, this reflection returns with additional force, especially as the genus *Aureliana* of Dr. Sendtner is at the same time made to be identical with it. If we compare the *Aureliana velutina*, Sendtn. (Flor. Bras. tab. 19) with the figure of *Athenæa anonacea*, Sendtn. (tab. 18 of the same work), and these again with the *Witheringia picta*, Mart. (Nov. Gen. et Sp. tab. 227), and my details of Gardner's plant (*ante* p. 5 and figured in pl. 35), and keep in recollection that the same species has been referred by M. Dunal, at the same time, both to his section *Athenæa* of *Withania* and to the genus *Bassovia* of Aublet, we must come to

the conclusion that the genera *Witheringia*, Mart., *Athenæa*, Sendtn., *Aureliana*, Sendtn., and *Bassovia*, Aubl., are identically one genus, and of these the latter must claim the priority, on account of its long previous existence. To the species of *Bassovia* enumerated by M. Dunal (Prodr. 405–411) we must therefore add *B. picta* (of which *B. Gardneri*, Dun., must be regarded as a synonym), *B. pogogena*, *B. mollis*, *B. micrantha*, *B. pyrifolia*, *B. Pohliana*, *B. Schottiana*, *B.? Novo-Friburgensis*, *B. Martiana*, *B. oocarpa*, *B. hirsuta*, and *B. anonacea*, nob.

I have hitherto only spoken of the section *Athenæa*, and it now remains to consider the other species included in the same genus by M. Dunal: of these it is evident that only two really belong to *Withania*—the original *W. aristata*, Pauq., and *W. frutescens*, Pauq., which form a genus marked by distinct characters, the limits and differential features of which have been defined in 'Hook. Journ.' i. 225 (also shown in p. 7 of this Appendix); the remaining nine species are referable to *Hypnoticum*, *Larnax* and *Puneera*, genera confounded by M. Dunal in the genus *Withania*. This last-mentioned genus differs from *Hypnoticum* in its urceolate calyx with five long setiform teeth, the tube expanding with the growth of the fruit into a large bell-shaped cup, with a still broader open mouth, in the bottom of which the berry is seated; this cup is of somewhat thickened texture, glabrous, and very reticulated by numerous strong transverse veins between its ten longitudinal nervures; the margin is almost entire, with five long setiform processes, which are extensions of the principal nerves: in *Hypnoticum* the calyx is tubular, very tomentose, with five broad short teeth; this increases in size, becomes inflated in the middle, contracted in the mouth, with five erect short teeth, finely reticulated in texture, and enclosing the berry as in *Physalis*. In *Withania* the corolla has the form of a very short tube below, with a limb of equal length, divided into five elongated narrow lobes obtuse at the apex; the stamens are shorter than the tubular portion; the filaments, much dilated at base, form a disjointed annular ring adnate to the base of the corolla; they are compressed, gradually narrowing toward their summit; the anthers, equal to them in length, are erect, pointed at the apex, and cordate at base, by the divarication of the two parallel cells: in *Hypnoticum* the corolla is smaller than in *Withania*, and more tubular; the tubular part, not exceeding the length of the calyx, is marked below the mouth with five coloured spots; it has a small border of five short angular reflexed teeth; the filaments are filiform, arising out of as many expanded processes adnate to the base of the corolla, and the anthers are formed of two parallel cells, without intervening connective. In *Withania* the stigma is formed of two lips with a large intermediate globular stigmatic gland: in *Hypnoticum* the stigma is clavate, obsoletely 2-lobed. In *Withania*

the berry is small, seated in the broadly campanular expanded calyx, containing few seeds, which are proportionally large, somewhat conchoid, the embryo of more than a circle, being spirally helical: in *Hypnoticum* the berry is larger, generally of a bright scarlet colour, 2-celled, filled with very numerous small seeds, which are reniform and compressed, with a spiral and nearly annular embryo; the cotyledons, equal in length to the terete radicle, are subdilated and accumbent. These differences are sufficiently evident and numerous enough to constitute a wide generic distinction—the affinity of *Hypnoticum* being much closer to *Physalis*, from which it differs in its much smaller corolla and the adnate placentation of its seeds.

M. Dunal has formed another section of *Withania* out of the *Puneeria coagulans* (Stocks), a plant extremely different from the former genus; in habit and structure it more nearly approaches *Hypnoticum*, resembling it greatly in the form of its flowers: the calyx, however, instead of becoming inflated to a larger diameter than the berry, and reticulated and vesicular, in *Puneeria* invests it closely, remaining opake and tomentous, destitute of visible nervures, brittle, and of the texture of tender paper. Its flowers are diœcious, a rare occurrence among the *Solanaceæ*; the corolla is tubular, scarcely funnel-shaped, with a narrow border of five short reflexed teeth: the whole plant is covered with dense tomentum consisting of stellated brachiate hairs, as in *Physalis* and *Hypnoticum*: in these features there is little in common with *Withania*.

Larnax differs from *Withania* in its herbaceous stems and fasciculated axillary flowers, in its minute urceolate calyx with five short blunt teeth, which increases in size with the growth of the fruit; it is of thin texture, becomes inflated and globular, closely investing and concealing the berry, its mouth being much contracted and tubular, as in *Margaranthus*. The corolla is somewhat bell-shaped, with a border equal in length to the tubular portion, divided into five expanded oblong segments: its stamens have capillary filaments. One species is made to form a section of *Withania* by M. Dunal (*Pseudowithania*), but it will be seen to hold little resemblance to that genus.

The remaining species before alluded to, included by M. Dunal in *Withania*, may therefore be thus disposed of; viz.—

1. *Withania somnifera*, Dun. is *Hypnoticum somniferum*, Rodr.
2. ——— *Morrisoni*, Dun. = *Larnax Morrisoni*, nob. Agreeing with this genus in its numerous fasciculated flowers, its small urceolate calyx and red berries enclosed in an inflated calyx, and in the country of its origin: its characters are quite at variance with *Withania*.

3. *Withania Orinocensis*, Dun. = *Larnax Orinocensis*, nob. (*huj. vol.* p. 29).
4. ——— *Xalapensis*, Dun. = *Larnax Xalapensis*, nob. (*ibid.*).
5. ——— *subtriflora*, Dun. = *Larnax subtriflora*, nob. (*ibid.*).
6. ——— *arborescens*, Dun. = of doubtful affinity, not only in regard to the genus, but to the family to which it belongs: its berry is said to be 10-celled, each cell being 1-seeded: it cannot therefore belong to *Solanaceæ*.
7. ——— *ramosa*, Dun. is *Larnax ramosa*, nob. Agreeing with this genus in the similarity of its inflorescence and structure of its flowers and its red berries enclosed in an inflated calyx, and the country of its origin.
8. ——— *sordida*, Dun. = *Larnax sordida*, nob. Referrible to this genus for the same reasons.
11. ——— *pulvinata*, Dun. = *Salpichroma pulvinatum*, nob. From the details given of it evidently belonging to this genus.
12. ——— *coagulans*, Dun. = *Puneeria coagulans*, Stokes.

The genus *Lycium* differs from all true *Solanaceæ* in the very imbricated æstivation of its corolla, as frequently pointed out, but this character has not been considered by M. Dunal as of any value, for he constitutes a section of this genus (*Schistocalyx*) out of two species, in one of which the corolla has apparently a valvate æstivation. The first species is the *Lycium ciliatum*, Schl., a plant referred by me on this very account to *Salpichroma* (*huj. op. vol.* i. p. 9.). As this reference has not been confirmed either by Dr. Sendtner or M. Dunal, it is necessary that I should repeat my reasons for the above conclusion. The habit of the plant, as described by Prof. Schlechtendal, is quite as much that of *Salpichroma* as that of *Lycium*; in both cases the axils of its branches, after the fall of its leaves, become nodose; the stems are angular, from the salient lines decurrent from the points of insertion of the petioles; the exserted stamens are in like manner often densely villous at the points of their origin. It differs however from *Lycium* in its calyx being divided nearly to the base into five very long linear segments, densely ciliated with glandular hairs, and which increases in size with the fruit; the corolla, nearly twice the length of the calyx, is funnel-shaped, with five reflexed subtriangular segments, which are glandularly ciliated on their margins, indicating a valvate or a plicato-valvate æstivation as in *Cestrum*: these segments in *Lycium* are invariably broad and rounded in their form, overlapping one another by their margins, of thin texture, which are almost always glabrous, except in a few cases where they are fringed with simple ciliate hairs: the berry is red, supported by its erect persistent calyx, the lobes of which exceed it in length, while in *Lycium* the berry is supported on its small unchanged cupshaped 5-toothed

calyx, not one-fourth or one-sixth the length of the fruit. These are all characters of *Salpichroma* and not of *Lycium*, and although certainly we have not positive evidence, we have every fair indication that the plant in question belongs to the former rather than to the latter genus. This subject will be again considered in a review I have prepared of the genus *Lycium*.

Another singular medley of incompatible genera, resulting from the rejection of the character of æstivation, occurs in the genus *Juanulloa*, which M. Dunal divides into three sections: 1. *Eujuanulloa*; 2. *Physalina*; 3. *Sarcophysa*. In *Juanulloa* proper we see a small group of plants, distinguished by their scandent habit, large thick coriacous leaves and conspicuous pendent flowers; the calyx, covered with dense yellow stellate tomentum, is formed of five distinct sepals, which are connivent by their tomentous margins into a pentagonous tube, with undulating prominent angles; this is persistent, increasing but little with the growth of the berry, which it partially encloses, being generally slit into its original segments by the separation of the adherent edges of the sepals; the corolla, covered also with orange-coloured tomentum, is twice or three times the length of the calyx, and in the form of an elongated narrow tube, somewhat ventricose in the middle, and contracted in the mouth, with a small border of five almost orbicular lobes, quincuncially imbricated in æstivation, being, as well as the tube, of a thick fleshy consistence; the berry is filled with seeds, having a nearly straight terete embryo: these characters are fully delineated in plate 46 of this volume. In *Sarcophysa* we find a corolla very similar in texture and structure, but larger and more ventricose; the calyx, of half its length, is fleshy in substance, roundly tubular, ventricose, decreasing in diameter towards the mouth, where it is terminated by five short erect teeth; this scarcely increases in size, but becomes still thicker, more coriaceous in texture, and is at length irregularly ruptured on one side, nearly to the base, by the growth of its enclosed large berry. This genus has been shown to be generically distinct from *Juanulloa* (*huj. vol.* p. 42), both being closely allied to *Solandra*; its characters are delineated in plate 47 of this work. The place in the system of *Juanulloa* and *Sarcophysa*, as I have shown, is not among the true *Solanaceæ*, but in the tribe *Solandreæ* of the *Atropaceæ*.

The section *Physalina* of M. Dunal belongs to a very different group, which I have described under the name of *Cleochroma*, a genus closely allied to *Iochroma*, and therefore belonging to the family of the true *Solanaceæ*. The *Juanulloa* (*Physalina*) *umbellata*, Dun. (Prodr. 530) is again recorded (Prodr. 491) as the *Iochroma calycina*, Benth., figured in 'Bot. Reg.' (1831)

tab. 20, both being an identical plant of Hartweg's collection (No. 1312), and described by me as *Cleochroma calycina* (*huj. vol.* p. 149). This and two other species of his section *Physalina* are frutescent shrubs, with leaves of more membranaceous texture, with conspicuous purple fasciculated flowers; the calyx is much larger than in *Iochroma*, tubular, thin in texture, 5-toothed, increasing considerably in size during the development of the flower, becoming ventricose in the middle, and finally enclosing the fruit; the corolla, of more membranaceous texture, is tubular, and of small diameter at its base, soon expanding above into a broad funnel-shape, with a wide conspicuous border of five large acute lobes, which are plicately valvate in æstivation; the fruit is a berry, conccaled by the membranaceous calyx, which is sometimes, but not always, split on one side; the seeds contain a slender, filiform, almost annular embryo; the yellowish down that invests the flowers of this species consists of simply articulated hairs: in *Juanulloa* the hairs of its dense tomentum are stellately brachiate. The second species of *Physalina*, the *Juanulloa grandiflora*, Dun., appears to me to agree well, in all essential respects, with my *Cleochroma grandiflora*, figured in plate 32 of the previous volume; it is the *Iochroma grandiflora*, Benth., and again described by M. Dunal (Prodr. 491) under that name; it seems to differ only in the blade of the leaves being somewhat shorter; and if the dimensions of the calyx, which always increases rapidly with the age of the flower, be taken as that of its ultimate growth (as shown in fig. 4 of the plate referred to), all the proportions and floral details will be found to accord completely with those of M. Dunal's description: should it be found, however, to be a distinct species, it may be called *Cleochroma Dunalii*. Upon the same evidence, *Juanulloa microphylla*, Dun., will become *Cleochroma microphylla*, nob. M. Dunal includes *Cleochroma* as a section of *Iochroma*: it is undoubtedly much allied to that genus, but I have offered strong reasons (see p. 147 of the preceding volume) to prove why it should be considered generically distinct. We have only to compare the details given in plates 46, 47, 32, 31 and 30 in this and the former volume, to be convinced of the great generic differences between *Juanulloa*, *Sarcophysa*, and *Cleochroma*, and of this last from *Iochroma*.

Codochonia of M. Dunal (Prodr. p. 482), if it be not identical with, is evidently allied most closely to *Hebecladus*, and not to *Atropa*, agreeing with the former in habit, and the æstivation and general structure of its floral parts, differing only in being 6-merous, and in having shorter stamens and style, which in other genera (as in *Solanum*, *Capsicum*, and his *Witheringia* for instance) are not allowed to constitute generic distinctions.

With the *Sicklera* of Dr. Sendtner (Prodr. p. 501) I am not

in the least degree acquainted, but from the description there given, it cannot be, as M. Dunal states, allied to *Lycium*, on account of its herbaceous habit and the valvate æstivation of its flowers: judging from the characters there described it appears to be very near *Capsicum*, and indeed to differ little from that genus: it accords in the form of its unchanged persistent calyx, in the shape and size of its corolla, the insertion of its short stamens, and its apiculated cordate subexserted anthers: there does not appear anything in the description of its other characters at variance with that genus.

Upon a few other genera described in the 'Prodromus' I shall at another time treat at more length, and in now closing these strictures upon the last volume of the 'Prodromus,' I beg to disclaim the slightest intention of reflecting either on M. Dunal or M. DeCandolle, who must ever demand our homage and highest esteem. I will here only allude slightly to the circumstance, that although M. Dunal in his important monograph has naturally availed himself to a large extent of the materials I have contributed towards a history of this family, he has, without the slightest reference to them, passed over altogether the several reasonings, and the numerous essential and differential characters I had given, with the view of distinguishing the several genera, and upon which I proposed to group the different tribes and sections of the order. In offering these remarks I am bound to say, that my principal motive has been to establish and ascertain the relative value of the facts so applied, and also to show that the illustrious author of that monograph in his arrangement of the *Solanaceæ* has not selected and employed those characters best suited to establish the affinities of the several natural divisions, that he has been incautiously drawn into many errors by neglecting to attend to certain fixed rules and valid characters already suggested by others, and that consequently his whole arrangement of the order is incomplete and unsatisfactory: it almost bears the semblance of having been compiled nearly twenty years ago under the imperfect state of our knowledge of the family at that time, and upon the defective system of arrangement then employed, the genera since established appearing as if now interpolated at random, without regard to their affinities, or placed as sections of old genera to which they bear no relation, and to which the characters there given are ill adapted: similar defects are apparent in the distribution of species in several genera, as I shall shortly have occasion to show in regard to the genus *Lycium*: at the same time all must agree that the whole forms a collection of materials of much value and importance. I do not presume to say that the distribution and characters I have proposed are the best that can be offered, but

as they seem to bring together the several well-marked groups, and with all their defects to offer to a great extent a consistency of arrangement, they are at least entitled to the indulgent consideration of botanists.

I cannot dismiss this review without adverting to the admirable work of Dr. Sendtner on the *Solanaceæ* of Brazil (Vienna, 1846), which is more especially deserving of attention because the classification there employed in the distribution of the very extensive and difficult genus *Solanum* has been fully adopted by M. Dunal in the 'Prodromus,' in preference to the unscientific arrangement in Don's 'Dictionary,' previously in use among botanists. The system of Dr. Sendtner is founded in great measure on the structure of the stamens, which afford valid characters, as I had long before observed and adopted for my own purposes. Dr. Sendtner has therefore rendered much service to science by this work, which everywhere displays originality of observation, his materials being classically and ably elaborated. His ordinal diagnosis of the *Solanaceæ* is infinitely preferable to that of M. Dunal, but notwithstanding this admission it is not free from some defects, among which may be mentioned the assertion that in the position of the embryo the extremity of the radicle points to the hilum. His synopsis of the distribution of the few genera indigenous in Brazil answers the purpose there intended, but is one quite unfitted for a classification of the whole family. The *Nolanaceæ* are here very properly excluded, although *Grabowskya* is placed in the *Solanaceæ* upon an erroneous principle, as explained in a former page (*ante*, p. 43). The *Cestrineæ* are likewise excluded from the *Solanaceæ* on account of their straight embryo, and, as suggested by Schlechtendal, placed in a separate family, while *Nicotiana*, *Petunia* and *Nierembergia*, also with a nearly straight embryo, are retained in the latter order; this is inconsistent, at the same time that the peculiar mode of æstivation in these genera, so different from *Solanaceæ*, is unnoticed. The Brazilian *Cestrineæ*, according to these views, are confined to *Cestrum* and *Metternichia*; the embryo in the former is said to be hemianatropous, in the latter anatropous, but I can perceive little difference in this respect, as in both cases the hilum is somewhat ventral and removed from the radicle, which points to the base of the seed as in *Nicotiana*: the only real distinction that I can perceive in the ordinal characters of Dr. Sendtner is that in *Solanaceæ* the calyx is "opisthodromicus $\left(\begin{smallmatrix} & \cdot & \\ \cdot & \circ & \cdot \\ & \cdot & \end{smallmatrix}\right)$, *i. e.* sepalo secundo postice verso, atque locum in mediana inter axin secundarium et primarium obtinente," and in the *Cestrineæ* the calyx is "emprosthodromicus $\left(\begin{smallmatrix} \cdot & & \cdot \\ & \circ & \\ \cdot & & \cdot \end{smallmatrix}\right)$,

i. e. laciniis 3 anticis et 2 posticis." These are hard words that might be better expressed by the more simple terms of 'posticeps' and 'anticeps': this character, if it be general, has certainly escaped my observation, and we might almost infer that it is not constant, since M. Dunal, who has evidently studied Dr. Sendtner's work, nowhere alludes to this feature. I have searched in vain for its constancy in dried specimens, and it must be confessed that it does not appear to be likely, from its very nature, to prove a character available for practical purposes, because by the mere torsion of the pedicel, in so small a quantity as one-tenth part of a revolution, an opisthodromical calyx becomes at once emprosthodromical. Besides, at all times it must be a doubtful test among the *Solanaceæ* and *Atropaceæ*, where the insertion of the peduncle is always more or less extra-axillary and lateral, forming a kind of inflorescence termed centrifugal; for here the point of the calyx, that under ordinary development would be directed towards the axis of its parent branchlet, is actually twisted away from it, so that in the more bilabiate genera of the *Atropaceæ* the two lips cease to be superior and inferior as in the true *Scrophulariaceæ*: this is very clearly manifest in *Nierembergia* and several other genera when examined in a living state. We should be guided by facts rather than by hypothesis in these cases.

Dr. Sendtner in his work (p. 225) has made some rather ill-natured remarks for my want of attention to what he conceived to be essential characters, quoting in addition that I had not observed the structure of the stamens in *Cyphomandra*, and had not noticed the articulation of the pedicel in *Cestrum*. My details of *Pionandra*, as illustrated in plate 8, were made, and the drawings taken from the living plants, ten years previously, though only published about the same time as *Cyphomandra*; these naturally differ in some respects from the dissections of Dr. Sendtner, made from dried specimens, and it is from this cause that this excellent botanist failed to observe the fleshy annular ring that I have depicted. It is true that I omitted to mention the articulation of the pedicel in *Cestrum*, as well as many other ordinary characters which it was not thought necessary to notice, but it is evident that this feature, which is common to other species, did not escape my observation, for in plate 16 of the same work, every flower of *Cestrum organense* there delineated will be seen to be distinctly articulated on its pedicel. If an omission of this kind has crept into the descriptions of the desultory nature I had adopted, it is evident that the more learned and systematic work of Dr. Sendtner is not less free from error; for instance, among many others, we may quote his generic character of *Hyoscyamus*, where the lobes of the corolla are said to be plicated in æstivation when they are really imbricated—the placentation is stated to be

free, whereas it was certainly adnate in the species I examined in a living state: he makes no mention whatever of the conspicuous epigynous gland that crowns the summit of the ovarium, which tends subsequently to the singular mode of dehiscence of its capsular fruit. In like manner this learned botanist failed to observe the gynobasic origin of the style in *Grabowskya*, which led to his error in placing that genus among the *Solanaceæ*, and he does not notice the erect position and basal insertion of its ovules, so contrary to all that is met with in that family. I merely quote these instances, out of a number of others, to show that the most accurate observers and the most learned men are as liable to errors and omissions as those of less pretensions, and they ought consequently to look charitably on the faults of others. The necessity of groping, as it were, in the dark in search of tangible facts, and treading the path firmly at every step, giving thus a desultory character to these communications, added to the rigour of detail, originating in my professional habit of proving everything by rule and by positive demonstration, may justify the charge made by Dr. Sendtner, who says of me, regarding these contributions, "rei botanicæ parum profuit: veras disciplinæ botanicæ notiones vilipendens," &c. (*loc. cit.* p. 225); and this dullness may account for my utter inability to comprehend the more refined and transcendental definitions of the German school. This accomplished botanist, describing in his elaborate work the nature of the inflorescence of the *Solanaceæ* (p. 181), has employed an extent of definition that would occupy ten close octavo pages, in order to describe that which appears to me might be made far more intelligible in almost as many lines. After giving my best attention to this elaborate diagnosis, I am yet unable to comprehend the finer distinctions of "recaulescent, concaulescent, estalechic, antidromical or homodromical" developments and their various combinations; nor can I perceive the utility of employing other new terms, such as "dichasia, concinna, cormanthæ, metapodia, hypopodia," and a number of others, in order to explain what we commonly understand by a simple or compound cyme or corymb, expressions long in use and comprehensible to everybody, without the necessity of employing words, involving ideas of development founded wholly on hypothesis. Besides, after all, the fact is known to all horticulturists that in the same species its habit and the development of its inflorescence are subject to much variation if grown in different soils, in a hot or cold temperature, in a moist or dry atmosphere, in exposed or open situations; hence the characters derivable from such sources are always variable, while those features observed in the development of the flowers and fruit are far more constant and always to be relied upon for scientific purposes. This consideration leads

us naturally to inquire how many out of the 900 kinds of *Solanum* enumerated by M. Dunal ought not to be considered as genuine species? There are many individuals of this genus that are perfect weeds and have become quite cosmopolitan, such for instance as *Solanum nigrum*, *S. dulcamara*, *S. pseudocapsicum*, *S. torvum*, &c.; these under different circumstances assume many varieties of development, and consequently figure in herbaria as numerous and distinct species.

In concluding these observations tending to justify the conclusions I have formed after a long and careful examination of the whole family of the *Solanaceæ*, it is necessary to offer a few words of apology, especially after the reproachful remarks of Dr. Sendtner before quoted. It will be seen that the different subjects there treated upon were published at frequent intervals during a space of seven years, in detached portions, without regard to any system of arrangement. At the commencement I had not the most distant thought of extending these investigations to the length they have been carried, step by step: sufficient proof of this is seen in the preface to the first memoir in 1845 (Lond. Journ. Bot.) and in the first number of my 'Illustrations' in 1846, my object, as there shown, being merely to publish the drawings and details of the plants I had collected abroad; but in attempting to define in succession the particular genus to which these plants belonged, I found myself continually at fault: hence arose the necessity of comparing them with those of other collections, among which may be mentioned the rich herbarium of Sir W. Hooker, who most liberally opened everything to my inspection, and those of the British Museum and Linnæan Society: these distant journeys, necessarily frequent, much increased the difficulties of my progress, for my only plan of procedure was to make sketches of each plant for comparison with others at a distance and with my own notes at home. The results were published in desultory succession as the subjects presented themselves to my notice: had the whole of these inquiries been completed before the publication of any portion, and each analysis compared carefully with others, aided by a knowledge of the real structure of the rest, there would have been more consecutiveness and uniformity in the general definitions. Some indulgence may therefore be claimed and allowance made for the many faults that have necessarily resulted from this mode of procedure, the only one at my command. Notwithstanding the manner in which the materials are thus scattered throughout those pages, much that is useful may indubitably be gleaned, both from the text and the drawings, towards our knowledge of the members of this family and their respective affinities: a great many new facts have been added, and others previously

known have been corrected; some progress has also been made towards a record of the essential as well as differential characters, and towards defining the more exact limits of each genus, and this has been throughout the full extent of my aim.

From what has been shown in the preceding remarks, it will be seen that much yet remains to be done before we obtain a proper arrangement of the *Solanaceæ* and the genera more immediately allied to them, and it certainly affords cause for regret that at a period of excellent opportunity, with such abundant materials, with every facility at command, and with a considerable amount of assistance from others, so imperfect a digest of the family should have appeared in the highest standard work of our time, the 'Prodromus' of M. DeCandolle.

END OF VOL. II.

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DESCRIPTION OF THE PLATES

IN VOLUME II.

Plate 35.

Exhibits a drawing of *Witheringia picta*, Mart.

Fig. 1, the calyx. *Fig.* 2, the corolla. *Fig.* 3, the same cut open, showing the position of the stamens: *nat. size.* *Fig.* 4, the tubular portion of the corolla, showing the attachment of the stamens upon an annular ring; the anthers are seen in different positions before and after dehiscence: *magnified.* *Fig.* 5, the calyx with its segments thrown back to show the pistil: *nat. size.* *Fig.* 6, the stigma with its glandular lobes: *magnified.* *Fig.* 7, the calyx having grown in size and enclosing the fruit. *Fig.* 8, the same with the segments thrown back to show the berry: *both nat. size.* *Fig.* 9, a seed: *nat. size.* *Fig.* 10, the same *magnified.* *Fig.* 11, the same seen edgeways. *Fig.* 12, a seed with half of the testa removed, showing the enclosed albumen. *Fig.* 13, the albumen cut longitudinally to show the position and form of the embryo: *all magnified.*

Plate 36.

A. is a branchlet of *Braohistus lanceæfolius.*

Fig. 1, is the calyx. *Fig.* 2, the corolla expanded: *nat. size.* *Fig.* 3, three of the stamens in different positions. *Fig.* 4, the pistil: *all magnified.*

B. is a portion of *Brachistus hebephyllus.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the corolla. *Fig.* 3, the same cut open to show the insertion of the stamens. *Fig.* 4, a stamen: *all magnified.* *Fig.* 5, the pistil with its enveloping calyx: *magnified.* *Fig.* 6, the same with the upper portion of the calyx removed, to show the hypogynous gland that embraces the base of the ovary. *Fig.* 7, the ripened berry supported by its persistent calyx: *nat. size.* *Fig.* 8, a transverse section of the berry, showing the mode of placentary attachment of the seeds: *magnified.*

Plate 37.

A. exhibits a portion of *Brachistus oblongifolius.*

Fig. 1, is a flower. *Fig.* 2, is the calyx with the pistil. *Fig.* 3, is the corolla cut open to show the insertion of the stamens: *all nat. size.* *Fig.* 4, two stamens seen before and behind: *magnified.*

B. is a branch of *Brachistus dimorphus*.

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx: *magnified.* *Fig.* 3, the corolla cut open to show the position of the stamens. *Fig.* 4, the stigma: *both magnified.*

Plate 38.

A. is a portion of *Saracha auriculata*, in fruit.

Fig. 1, a flower. *Fig.* 2, the calyx. *Fig.* 3, two of the stamens. *Fig.* 4, the pistil. *Fig.* 5, a transverse section of the berry with its supporting calyx: *all nat. size.*

B. is a branch of *Saracha propinqua*.

Fig. 1, the corolla cut open to show the insertion of the stamens. *Fig.* 2, a stamen: *all nat. size.* *Fig.* 3, an anther *magnified.* *Fig.* 4, the pistil: *nat. size.* *Fig.* 5, the stigma: *magnified.* *Fig.* 6, section of a seed. *Fig.* 7, the embryo extracted. *Fig.* 8, glandular hairs of the pubescence: *all magnified.*

Plate 39.

A. is *Saracha glandulosa*.

Fig. 1, is the flower: *nat. size.* *Fig.* 2, the same *magnified.* *Fig.* 3, the calyx. *Fig.* 4, the corolla: *both magnified.* *Fig.* 5, four of the stamens seen in different positions, with the mode of their attachment to the base of the corolla: *more highly magnified.*

B. is a branchlet of *Physalis gracilis*.

Fig. 1, is a flower. *Fig.* 2, a stamen: *both nat. size.* *Fig.* 3, one of the articulated hairs of the pubescence: *magnified.*

C. shows analytical details of *Physalis Peruviana*.

Fig. 1, is a flower. *Fig.* 2, the corolla, seen from above. *Fig.* 3, the same cut open, showing the coloured basal spots, and the stamens with the mode of their insertion: *all nat. size.* *Fig.* 4, one of the articulated and brachiate hairs of the pubescence: *magnified.* *Fig.* 5, three of the anthers seen in different positions, showing their manner of dehiscence: *also magnified.* *Fig.* 6, the pistil with the calyx thrown back, showing the ovary seated on its hypogynous gland: *nat. size.* *Fig.* 7, a longitudinal section of the same, showing the attachment of the ovules. *Fig.* 8, a transverse section of the ovarium to show the two cells, the form of the placenta in each cell with the ovules attached. *Fig.* 9, the stigma seen in two positions. *Fig.* 10, a longitudinal section of a seed with its embryo imbedded in albumen: *all more or less magnified.*

Plate 40.

Exhibits *Nectouxia bella*.

Fig. 1, a flower, showing the projecting corona in the mouth of the corolla. *Fig.* 2, the calyx, with the pistil enclosed. *Fig.* 3, the same, with the segments of the calyx thrown back, to show the ovary upon its supporting gland. *Fig.* 4, the corolla cut

open, showing the included stamens: *all nat. size.* *Fig.* 5, a stamen seen in front. *Fig.* 6, the same seen from behind. *Fig.* 7, the filament expanded towards its apex. *Fig.* 8, an anther detached from the filament, seen in front, depicting the mode of dehiscence of its cells. *Fig.* 9, the stigma with a portion of the style: *all magnified.*

Plate 41.

Displays a branchlet of *Phrodus Bridgesii.*

Fig. 1, is the calyx, with its included pistil. *Fig.* 2, the corolla. *Fig.* 3, the same cut open, showing the insertion of the stamens. *Fig.* 4, two of the stamens with the hairy tufts at the base of the filaments. *Fig.* 5, the pistil, supported by the calyx, which is thrown back. *Fig.* 6, the ripe berry, enclosed in the persistent calyx. *Fig.* 7, the berry removed. *Fig.* 8, a transverse section of the same, showing its two cells, and the placentary attachment of its seeds. *Fig.* 9, a seed: *all nat. size.* *Fig.* 10, the same *magnified.* *Fig.* 11, the same, seen edgeways. *Fig.* 12, a longitudinal section of a seed, showing its embryo enclosed in albumen: *both also magnified.*

Plate 42.

A. is *Phrodus microphyllus.*

Fig. 1, is a flower. *Fig.* 2, the calyx. *Fig.* 3, the corolla. *Fig.* 4, the same cut open, showing the insertion of the stamens. *Fig.* 5, two of the stamens detached. *Fig.* 6, the ovary upon its hypogynous gland, supported by the calyx, which is thrown back: *all nat. size.* *Figs.* 7 & 8, articulated hairs of the pubescence: *magnified.*

B. is *Phrodus nodosus.*

Fig. 1, is a flower: *nat. size.* *Fig.* 2, anthers, before and after dehiscence. *Fig.* 3, the stigma. *Fig.* 4, one of the leaves articulated on its persistent cupuliform callus, with other calli from which the leaves have fallen, all seated in the cartilaginous node of the axil: *all magnified.*

Plate 43.

Is the end of a branch of *Nicandra physaloides.*

Fig. 1, is a flower. *Fig.* 2, the corolla. *Fig.* 3, the same cut open, showing the enclosed stamens: *all nat. size.* *Fig.* 4, a stamen, with the filaments fornicated at its base, arising from its somewhat trigonous cup-shaped hairy gland; the mode of its attachment to the corolla is here seen: *magnified.* *Fig.* 5, the pistil seated on its hypogynous gland: *nat. size.* *Fig.* 6, a longitudinal section of the ovary: *magnified.* *Fig.* 7, the fruit enclosed in the persistent calyx. *Fig.* 8, the berry, removed. *Fig.* 9, a transverse section of the same, showing the manner in which the lobes of the irregularly ramified fleshy placentæ become confluent with the walls of the ovary, which hence produces a 3-, 4-, or 5-celled fruit. *Fig.* 10, a seed: *all nat. size.* *Fig.* 11, a longitudinal section of the seed, showing the embryo enclosed in albumen, and the lateral hilum. *Fig.* 12, the embryo extracted: *both magnified.*

Plate 44.

Gives a drawing of a branchlet of *Cliocarpus Gardneri.*

Fig. 1, is an axillary raceme of *C. megalochiton*, with some of the flowers fallen off.

showing the approximated and secund disposition of the pedicels, and the mode of their articulation upon the main peduncle. *Fig.* 2, is a flower of the same. *Fig.* 3, the corolla seen from above. *Fig.* 4, the calyx, showing the saccate base of its lobes, and the inflexed valvate juxtaposition of their margins: *all nat. size.* *Fig.* 5, a portion of the corolla, to show the origin of the stamens from a fleshy annular basal ring: *magnified.* *Fig.* 6, stamens, seen before, behind, and sideways, displaying their mode of dehiscence. *Fig.* 7, the upper portion of an anther, exhibiting the same more distinctly, together with its 4-locellate division: *still more magnified.* *Fig.* 8, pistil: *magnified.* *Fig.* 9, fruit of *C. Gardneri* in its persistent calyx. *Fig.* 10, the same separated from the calyx: *both nat. size.* *Fig.* 11, a seed. *Fig.* 12, the same with half of the testa removed, showing the albumen in its integument. *Fig.* 13, section of the same, with the embryo enclosed in its substance. *Fig.* 14, the embryo extracted: *all magnified.*

Plate 45.

Is the upper portion of a branch of *Marckea coccinea.*

Fig. 1, is the calyx. *Fig.* 2, the corolla. *Fig.* 3, the same, cut open to show the enclosed stamens. *Fig.* 4, a stamen, with its filament bearded at its base: *all nat. size.* *Fig.* 5, anthers seen before and behind. *Fig.* 6, the same, after dehiscence: *both magnified.* *Fig.* 7, the ripe fruit enclosed in the persistent calyx, with some of its segments thrown back. *Fig.* 8, the baccately capsular fruit, with the segments of the calyx removed. *Fig.* 9, a transverse section of the same, to show the two cells, and the mode of placentation of the seeds. *Fig.* 10, a longitudinal view of the same, with the pericarpial covering cut in two, and one half thrown back, to show the dissepiment, and the mode of attachment of its imbricately disposed seeds: *all nat. size.* *Fig.* 11, two of the seeds, showing the mode of their attachment to the placentary dissepiment: *magnified.* *Fig.* 12, longitudinal section of a seed, with its external testa, and the embryo enclosed in albumen: the position of the hilum is shown upon the ventral face near the base. *Fig.* 13, the embryo extracted: *both also magnified.*

Plate 46.

Shows a terminal portion of a branch of *Juanulloa Panamensis.*

Fig. 1, is a flower. *Fig.* 2, the ripe fruit, enclosed in the persistent calyx, with its five basal saccate prominences. *Fig.* 3, one of the segments of the calyx removed, to show the manner in which the saccate prominences seen in its base are produced. *Fig.* 4, the berry, with the segments of the calyx removed. *Fig.* 5, a transverse section of the same, showing its two cells, and the seeds attached to the axile thickened placenta. *Fig.* 6, seeds seen on their lateral and dorsal faces: *all nat. size.* *Fig.* 7, the same *magnified.* *Fig.* 8, the same, with half of the testa removed, showing the lateral hilum near its base, and the enclosed albumen. *Fig.* 9, the albumen removed. *Fig.* 10, a longitudinal section of the same, with its enclosed embryo. *Fig.* 11, the embryo removed, shown in two positions: *all also magnified.*

Details of *Juanulloa Hookeriana.*—*Fig.* 12, the terminal raceme, with a single flower remaining, showing the calyx in its earlier inflated state, with the woolly margins of its free segments adhering in form of a tube. *Fig.* 13, is a flower when the calyx shrinks, and begins to assume a pentangular form. *Fig.* 14, the corolla. *Fig.* 15, the same cut open, to show the included stamens: *all nat. size.* *Fig.* 16, the anthers seen

in different positions: *magnified.* *Fig.* 17, the calyx, with its free segments still adhering by their margins at base, two of them being cut away to show the pistil, surrounded at its base by its lobed hypogynous gland: *nat. size.* *Fig.* 18, the ovary with its hypogynous gland: *magnified.* *Fig.* 19, the two-lobed stigma. *Fig.* 20, a longitudinal section of the same, showing one of its lobes, and the hollow in the summit of the style: ***all likewise magnified.***

Plate 47.

Is a branch of *Sarcophysa speciosa.*

Fig. 1, a flower with its inflated fleshy tubular calyx, divided by five short clefts at its summit. *Fig.* 2, the corolla. *Fig.* 3, the fruit, enclosed in its thick, coriaceous, persistent calyx, which becomes irregularly lacerated on its side, by the growth of the large berry.

Plate 48.

Shows a portion of *Ectozoma Pavonii.*

Fig. 1, is a flower. *Fig.* 2, the calyx with its enclosed pistil. *Fig.* 3, the pistil removed. *Fig.* 4, the corolla cut open to show the included stamens: *all nat. size.* *Fig.* 5, the corolla, showing the mode of æstivation of its segments. *Fig.* 6, the same cut open, showing the stamens attached to the back of a free annular ciliated ring, which arises from the contracted portion of the corolla.

Plate 49.

Exhibits a branch of *Cacabus Nolanoides.*

Fig. 1, the delicately membranaceous and reticulated calyx. *Fig.* 2, the corolla cut open to show the included stamens. *Fig.* 3, a section of the calyx saccate at its base, showing the enclosed pistil: *all nat. size.* *Fig.* 4, the stamens *magnified*, seen in different positions. *Fig.* 5, the stigma, *also magnified.*

Details of *Cacabus prostratus.*—*Fig.* 6, the fruit enclosed in its delicately reticulated persistent calyx. *Fig.* 7, the berry removed, showing its apical epigynous gland, and the persistent base of the style: *both nat. size.* *Fig.* 8, the same, *magnified.* *Fig.* 9, a transverse section of the same, showing the thin dissepiment, and its free lunated placentæ and attached seeds: *also magnified.* *Fig.* 10, seeds: *nat. size.* *Fig.* 11, a seed: *magnified.* *Fig.* 12, a longitudinal section of the same, showing the lateral hilum, and the embryo enclosed in albumen. *Fig.* 13, the embryo removed: ***both also magnified.***

Plate 50.

Is a drawing of *Thinogeton Miersii.*

Fig. 1, is the calyx. *Fig.* 2, the corolla cut open to show the position of the stamens: *both nat. size.* *Figs.* 3 & 4, stamens before and after dehiscence. *Fig.* 5, transverse section of an anther after the discharge of its pollen: *all magnified.* *Fig.* 6, the entire pistil: *nat. size.* *Fig.* 7, the stigma, front and side view: *magnified.* *Fig.* 8, the fruit concealed within the persistent calyx. *Fig.* 9, the fruit removed from the calyx. *Fig.* 10, transverse section of ditto, showing placentation of seeds. *Fig.* 11, seeds: *all nat. size.* *Fig.* 12, a seed. *Fig.* 13, a longitudinal section of ditto. *Fig.* 14, the embryo extracted from the albumen: ***all magnified.***

Plate 51.

Is a plant of *Salpiglossis purpurea.*

Fig. 1, the corolla in bud, showing the peculiar mode of its æstivation, which resembles that of *Petunia.* ***Fig.*** 2, the same cut open, showing the enclosed stamens. ***Fig.*** 3, a calyx. ***Fig.*** 4, the same cut open to show its nervures. ***Fig.*** 5, the pistil supported by its hypogynous gland, with the calyx cut away from the pedicel, placed in two positions to show the form of the stigma: *all nat. size.* ***Fig.*** 6, the stigma: *magnified.* ***Fig.*** 7, the anthers seen in different positions, before and after dehiscence. ***Fig.*** 8, the ovary, with a portion of the enveloping calyx, and surrounded at its base by its bilobed hypogynous gland. ***Fig.*** 9, a transverse section of the same, showing its fleshy placentæ in the middle of a thin dissepiment: *all magnified.* ***Fig.*** 10, the two-valved capsule, partly enclosed in the persistent calyx. ***Fig.*** 11, the same burst open, with the calyx cut away. ***Fig.*** 12, one of the valves split at its summit. ***Fig.*** 13, the dissepiment, with its adnate placenta and attached seeds. ***Fig.*** 14, the seeds: *all nat. size.* ***Fig.*** 15, longitudinal sections of the seed, showing the lateral hilum, and the embryo enclosed in albumen. ***Fig.*** 16, the embryo removed: *both magnified.*

Details of *Salpiglossis sinuata.*—***Fig.*** 17, longitudinal sections of its seed. ***Fig.*** 18, the embryo removed, showing its more spirally curved form, the end of the radicle always pointing to a spot removed from the hilum: *both magnified.*

Plate 52.

Is *Pteroglossis laxa.*

Fig. 1, a flower: *nat. size.* ***Fig.*** 2, the calyx. ***Fig.*** 3, the corolla. ***Fig.*** 4, corolla cut open to show the stamens: *all magnified.* ***Fig.*** 5, a stamen *still more magnified.* ***Fig.*** 6, the pistil, with the calyx cut open and thrown back to show the stipitate disk that supports the ovary: *magnified.* ***Figs.*** 7, 8 & 9, the style and stigma seen in different positions, *still more magnified.* ***Fig.*** 10, is the ovary and calyx, with the persistent cupular base of the corolla cut away to show the disk: *more magnified.* ***Fig.*** 11, capsule enclosed in the persistent calyx: *nat. size.* ***Fig.*** 12, ditto, showing the mode of opening its valves, with its placentiferous dissepiment.

Plate 53.

Is a drawing of *Leptoglossis Schwenkioides.*

Fig. 1, is a flower in bud to show the æstivation of the corolla. ***Fig.*** 2, is the same opened: *both nat. size.* ***Fig.*** 3, the corolla. ***Fig.*** 4, ditto cut open to show the relative size and position of the stamens. ***Fig.*** 5, a stamen. ***Fig.*** 6, ditto, with the anther after its dehiscence. ***Fig.*** 7, the entire pistil with half of the calyx removed to show the stipitate disk which supports the ovary and the stigma seen from behind. ***Fig.*** 8, ditto, with the calyx removed and the stigma viewed sideways: *all magnified.* ***Fig.*** 9, the stipitate disk with a portion of the calyx *still more magnified.*

Plate 54.

Shows *Browallia tenella.*

Fig. 1, the calyx. ***Fig.*** 2, the corolla in æstivation. ***Fig.*** 3, the same blown. ***Fig.*** 4,

ditto cut open to show the position of the stamens. *Fig.* 5, the entire pistil with the calyx cut open and thrown back: *all magnified.* *Fig.* 6, the two upper stamens, each with a sterile anther-lobe. *Fig.* 7, the two lower stamens, each with two fertile anther-lobes. *Fig.* 8, the stigma: *all more magnified.* *Fig.* 9, the capsule after dehiscence: *magnified.* *Fig.* 10, seeds: *nat. size.* *Figs.* 11 & 12, ditto. *Fig.* 13, section of seed. *Fig.* 14, embryo extracted: *all magnified.*

Plate 55.

Exhibits *Streptosolen Jamesoni*.

Fig. 1, a flower with the corolla in the act of opening, showing the plicated and imbricated disposition of its lobes in æstivation. *Fig.* 2, the same with the border fully blown; the tube is seen always more or less twisting: *both nat. size.* *Fig.* 3, corolla cut open to show the relative size and position of the stamens. *Fig.* 4, the pistil, with the manner in which the anthers embrace the stigma: *both magnified.* *Fig.* 5, the upper pair of stamens, each with a sterile anther-lobe. *Fig.* 6, the lower pair of stamens, each with two fertile anther-lobes showing their mode of dehiscence. *Figs.* 7 & 8, the stigma before and after æstivation: *all more magnified.* *Fig.* 9, the ovary with the calyx thrown back to show the stipitate hypogynous disk. *Fig.* 10, a transverse section of the ovary: *both magnified.*

Plate 56.

Is a drawing of *Brunsfelsia nitida*, showing the great difference in the form of the corolla and the dissimilar structure of the fruit in this genus as compared with that of *Franciscea* (shown in Plate 59), with which genus it has been associated.

Fig. 1, is the corolla cut open to show the position of the stamens. *Fig.* 2, the calyx. *Fig.* 3, the pistil: *all nat. size.* *Figs.* 4 & 5, the two pairs of stamens. *Figs.* 6 & 7, the stigma. *Fig.* 8, the ovary with its hypogynous disk. *Fig.* 9, transverse section of ditto: *all magnified.* *Fig.* 10, fruit of *Brunsfelsia undulata*, a fleshy drupe. *Fig.* 11, the same, with half of the fleshy sarcocarp removed to show the indehiscent putamen. *Fig.* 12, one of its many seeds: *all nat. size.* *Fig.* 13, a seed. *Fig.* 14, the same, with half of the testa removed. *Fig.* 15, the albumen deprived of its integuments. *Fig.* 16, longitudinal section of ditto. *Figs.* 17 & 18, the embryo removed, seen in two positions.

Plate 57.

Represents *Margaranthus tenuis*.

Fig. 1, the calyx. *Fig.* 2, the corolla. *Fig.* 3, the same cut open to show the stamens. *Fig.* 4, the pistil: *all nat. size.* *Fig.* 6, a stamen seen before and behind. *Fig.* 7, the same, showing the mode of its dehiscence: *both magnified.* *Fig.* 8, the baccate fruit enclosed within the persistent calyx. *Fig.* 9, the same, with the calyx removed. *Fig.* 10, seeds: *all nat. size.* *Fig.* 11, longitudinal section of a seed. *Fig.* 12. the embryo extracted: *both magnified.*

Plate 58.

Is *Leucophyllum campanulatum*.

Fig. 1, is a flower. *Fig.* 2, the calyx and pistil. *Fig.* 3, the corolla. *Fig.* 4, the

pistil. *Fig.* 5, corolla cut open, showing the stamens: *all nat. size.* *Fig.* 6, anthers seen in front and behind, before dehiscence. *Fig.* 7, the same after dehiscence. *Fig.* 8, the stigma before and after æstivation. *Fig.* 9, the ovary, supported on its hypogynous disk. *Fig.* 10, transverse section of ditto: *all magnified.* *Fig.* 11, the persistent calyx enclosing the fruit. *Fig.* 12, the capsule removed: *both nat. size.* *Fig.* 13, the same *magnified*, showing the manner of its dehiscence. *Fig.* 14, half of ditto removed, to show the introflexed margin of each valve. *Fig.* 15, the loose placenta, separated from the middle of ditto: *all magnified.* *Fig.* 16, seeds: *nat. size.* *Fig.* 17, a seed, back view. *Fig.* 18, side view. *Fig.* 19, front view of the same, showing the lateral hilum towards the base. *Fig.* 20, albumen removed from ditto, seen in front and sideways. *Fig.* 21, longitudinal section of ditto. *Fig.* 22, embryo removed: *all magnified.*

Plate 59.

Exhibits *Franciscea capitata.*

Fig. 1, a flower supported by its bracts, seen in front. *Fig.* 2, the same seen from behind, to show the peculiar introflexion of the mouth of the tube, a constant character of the genus. *Fig.* 3, the corolla in bud, showing its very imbricated æstivation. *Fig.* 4, a corolla cut open, to show the position of the stamens and the manner of introflexion of the mouth of the tube: *all nat. size.* *Fig.* 5, the anthers before and after dehiscence, seen in different positions: *magnified.* *Fig.* 6, the pistil: *nat. size.* *Fig.* 7, the stigma, with the upper portion of the style: *magnified.* *Fig.* 8, longitudinal section of the ovary: *magnified.* *Fig.* 9, capsule enclosed in the persistent calyx. *Fig.* 10, the same, with the calyx removed. *Fig.* 11, the same, in the act of its dehiscence. *Fig.* 12, side view of the dissepiment with its attached seeds. *Fig.* 13, front view of the same. *Fig.* 14, seeds: *all nat. size.* *Fig.* 15, longitudinal section of a seed. *Fig.* 16, embryo extracted: *both magnified.*

Plate 60.

Is a drawing of *Polydiclis multivalvis.*

Fig. 1, is a flower of *Polydiclis quadrivalvis.* *Fig.* 2, the calyx. *Fig.* 3, the corolla. *Fig.* 4, the same cut open to show the position of the stamens. *Fig.* 5, the pistil: *all nat. size.* *Fig.* 6, a stamen, before and after dehiscence. *Fig.* 7, the stigma: *both magnified.* *Fig.* 8, capsule enclosed in its persistent calyx. *Fig.* 9, the same, with the calyx removed. *Fig.* 10, transverse section of the same. *Fig.* 11, seeds: *all nat. size.* *Fig.* 12, a seed. *Fig.* 13, section of ditto. *Fig.* 14, embryo extracted: *all magnified.*

Plate 61.

Represents *Pionandra pinnata.*

Fig. 1, a flower. *Fig.* 2, the calyx. *Fig.* 3, the corolla cut open, with the anthers removed: *all nat. size.* *Fig.* 4, the stamens, showing the mode of dehiscence of the anthers, and the union of the filaments into a short annular tube: *magnified.* *Fig.* 5, the pistil: *nat. size.* *Fig.* 6, longitudinal section of the hollow clavate stigma: *magnified.*

Plate 62.

Exhibits *Tessarandra Fluminensis.*

Fig. 1, a flower: *natural size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla seen from

above. *Fig.* 4, the same seen sideways. *Fig.* 5, the same cut open, showing the position of its extrorse stamens: *all magnified.* *Fig.* 6, the stamens seen sideways, and from their internal or dorsal face. *Fig.* 7, the same, seen from the external face, and sideways, before and after dehiscence: *all more magnified.* *Fig.* 8, a grain of pollen: *highly magnified.* *Fig.* 9, the pistil: *nat. size.* *Fig.* 10, the same: *magnified.* *Fig.* 11, a longitudinal section of the same across the dissepiment, as well as of the calyx. *Fig.* 12, longitudinal section of the same, in a direction parallel with the dissepiment, to show the mode of attachment of the ovules. *Fig.* 13, transverse section of the same: *all magnified.* *Fig.* 14, fleshy drupe: *natural size.* *Fig.* 15, its putamen. *Fig.* 16, longitudinal section of the same, showing one abortive cell and the other containing a single seed suspended from its apical hilum. *Fig.* 17, the seed extracted, with the thin outer coating removed, to show the distribution of the raphe, in the form of a cottony web of delicate spiral threads, covering its surface, and intervening between it and the more internal testa (see Linn. Trans. vol. xxii. p. 93). *Fig.* 18, the same *magnified*, to show the disposition and course of these threads in intersecting bundles, all proceeding from the apical hilum. *Fig.* 19, the testa and inner integument with a basal chalaza, the raphe having been removed: *nat. size.* *Fig.* 20, the exalbuminous embryo with its small apical radicle. *Fig.* 21, the radicle, separated from the large fleshy cotyledons: *all nat. size.*

Plate 63.

Different analyses to show the structure of the genus *Schwenkia*.

A.—Section 1. *Cestranthus.*

Fig. 1, a flower of *S. grandiflora*: *nat. size.* *Fig.* 2, the same: *magnified.* *Fig.* 3, the same, with the segments of the corona expanded, showing the two exserted stamens and style. *Fig.* 4, the same cut open, displaying the marginal adhesion of the segments of the corona in æstivation, the mode of their insertion within the teeth of the true border of the corolla, the two fertile and the three rudimentary stamens. *Fig.* 5, the pistil, with half of the calyx cut away, showing the ovary seated within the persistent base of the corolla, which is there circumscissile: *all magnified.*

B.—Section 2. *Chætochilus.*

Fig. 1, a flower of *S. Brasiliensis*: *nat. size.* *Fig.* 2, the upper portion of the corolla, showing the narrow elongated segments of the true border of the corolla, which are valvate in æstivation: the corona is here reduced to the size of five small teeth, which are also valvate in æstivation. *Fig.* 3, the same with the segments of the border and corona opened. *Fig.* 4, the same cut open, to show the position of the two fertile and three rudimentary stamens: *all magnified.* *Fig.* 5, the capsule in its persistent calyx. *Fig.* 6, the capsule removed. *Fig.* 7, the same burst open, showing the dissepiment: *all nat. size.* *Fig.* 8, the capsule. *Fig.* 9, a transverse section of the same. *Fig.* 10, the capsule with the valves fully opened, showing the position of the seeds upon the dissepiment. *Fig.* 11, the dissepiment with the placenta in the middle. *Fig.* 12, the same seen edgeways, showing the attachment of the seeds. *Fig.* 13, the seeds: *all somewhat magnified.* *Fig.* 14, a seed. *Fig.* 15, the same, with half of its testa removed. *Fig.* 16, a longitudinal section of the albumen, with the embryo imbedded in it. *Fig.* 17, the embryo extracted: *all much magnified.*

C.—Section 3. *Euschwenkia.*

Fig. 1, a flower of *S. Americana*: *nat. size.* *Fig.* 2, the same: *magnified.* *Fig.* 3, the corolla of the same cut open, showing the five segments of the border of different lengths, reduced to the form of clavate lobes, placed in the sinuses of the five small emarginated teeth of the corona. *Fig.* 4, one of the ciliated teeth of the corona: *more magnified.* *Fig.* 5, the pistil, with the persistent calyx thrown back, to show the ovary seated within the persistent base of the corolla. *Fig.* 6, the ovary somewhat stipitate, with half of the calyx and half of the persistent base of the corolla cut away: *all more or less magnified.*

D.—Section 4. *Brachyhelus.*

Fig. 1, a flower of *S. angustifolia*: *nat. size.* *Fig.* 2, the same. *Fig.* 3, the corolla cut open, showing the five clavate lobes (the segments of the true border) and the position of the inner emarginated segments of the corona, two of which are thrown forward; the relative size and position of its four didynamous stamens are there seen. *Fig.* 4, the pistil, with the calyx cut open, showing the ovary seated within the persistent base of the corolla: *all magnified.* *Fig.* 5, the capsule half enclosed in the persistent calyx: *nat. size.*

E.—Section 5. *Cardiomera.*

Fig. 1, a flower of *S. Tweediei*: *nat. size.* *Fig.* 2, the same, showing the more external small uncinate lobes (which are the reduced segments of the true border), and the large broad segments of the corona, which are plicated in æstivation, with the margins valvately applied on each other. *Fig.* 3, corolla, showing the manner of opening of the segments of the corona. *Fig.* 4, the same seen from above, to show the æstivation and relative position of the uncinate lobes of the border. *Fig.* 5, the corolla cut open, displaying the relative position of the same parts, and of the two fertile, the two sterile and the one rudimentary stamens. *Fig.* 6, the pistil, with the persistent base of the corolla around the ovary: *all magnified.* *Fig.* 7, the stamens, seen before and behind. *Fig.* 8, the stigma: *both more magnified.* *Fig.* 9, the ovary surrounded at the base by its adnate hypogynous lobed disk, and by the free persistent base of the corolla, enclosed within the calyx, half of which is cut away: *magnified.*

Plate 64.

A. portion of a branch of *Lycium sævum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla cut open to show the position of the perfectly smooth stamens. *Fig.* 4, the pistil with half of the calyx cut away, where the ovary is seated in the persistent circumscissile base of the corolla: *all magnified.* *Fig.* 5, a tooth of the calyx: *more magnified.*

B. part of a branch of *Lycium Europæum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla cut open. *Fig.* 4, a stamen. *Fig.* 5, the pistil: *all magnified.*

C. a part of *Lycium Indicum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla cut open. *Fig.* 4,

the pistil. *Fig.* 5, the ovary with its hypogynous gland seated in the persistent base of the corolla, the calyx being entirely removed: *all magnified.*

D. a fragment of *Lycium oxycarpum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the corolla cut open. *Fig.* 3, the calyx. *Fig.* 4, one of its teeth. *Fig.* 5, the pistil, with its hypogynous gland: *all magnified.* *Fig.* 6, stamens, seen before and behind: *more magnified.*

E. part of a branch of *Lycium intricatum.*

Fig. 1, a flower. *Fig.* 2, the corolla: *both nat. size.* *Fig.* 3, the calyx. *Fig.* 4, the corolla cut open. *Fig.* 5, the pistil with the persistent base of the corolla: *all magnified.* *Fig.* 6, upper portion of style with the stigma: *more magnified.*

F. is *Lycium halophyllum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla cut open. *Fig.* 4, style and stigma: *all magnified.* *Fig.* 5, two of the teeth of the calyx: *more magnified.*

PLATE 65.

A. a portion of *Lycium orientale.*

Fig. 1, a flower showing the ordinary condition of its structure: *nat. size.* *Fig.* 2, its calyx. *Fig.* 3, the corolla cut open. *Fig.* 4, its apiculated anthers. *Fig.* 5, the pistil seated in the persistent base of the corolla: *all magnified.* *Fig.* 6, a flower of a specimen from Arabia Petræa, somewhat modified: *nat. size.* *Fig.* 7, its calyx. *Fig.* 8, the corolla cut open. *Fig.* 9, the pistil, with persistent base of the corolla and bottom of the calyx: *all magnified.*

B. a branchlet of *Lycium Persicum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla cut open. *Fig.* 4, the pistil, with half of the calyx cut away, showing the ovary seated in the persistent base of the corolla: *all magnified.*

C. is *Lycium Austrinum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla cut open. *Fig.* 4, the pistil with half of the calyx removed, when the persistent base of the corolla is seen around the ovary: *all magnified.*

D. is *Lycium hirsutum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla cut open: *both magnified.*

E. a portion of *Lycium arenicolum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla cut open. *Fig.* 4, the pistil seated in the persistent base of the corolla. *Fig.* 5, the latter removed, to show the hypogynous gland at the base of the ovary: *all magnified.*

F. a branch of *Lycium oxycladum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla cut open. *Fig.* 4, the pistil with half of the calyx cut away, that the persistent base of the corolla about the ovary may be seen: *all magnified.*

Plate 66.

A. shows a small branch of *Lycium roridum.*

Fig. 1, flower: *nat. size.* *Fig.* 2, calyx and style. *Fig.* 3, one of the teeth of its calyx. *Fig.* 4, corolla cut open showing stamens. *Fig.* 5, one of the stamens: *all magnified.* *Fig.* 6, berry in its persistent calyx. *Fig.* 7, a seed: *both nat. size.*

B. a portion of *Lycium acutifolium.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, calyx. *Fig.* 3, corolla cut open showing the stamens. *Fig.* 4, the pistil, showing the ovary surrounded at its base by the persistent cup of corolla: *all magnified.*

C. a portion of *Lycium Afrum.*

Fig. 1, calyx. *Fig.* 2, corolla cut open. *Fig.* 3, stamen. *Fig.* 4, pistil surrounded by the induvial base of corolla: *all somewhat magnified.*

D. a portion of *Lycium glaucum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, calyx, *Fig.* 3, corolla cut open. *Fig.* 4, a stamen. *Fig.* 5, a portion of the corolla with the stamens removed, showing the pubescent summits of the nervures upon which the filaments are attached. *Fig.* 6, the pistil: *all somewhat magnified.*

E. a fragment of *Lycium echinatum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, corolla cut open. *Fig.* 3, half of the calyx removed, to show the enclosed stipitate ovarium surrounded at its base by the small induvial cup of corolla: *all magnified.*

F. a portion of *Lycium tetrandrum.*

Fig. 1, flower: *nat. size.* *Fig.* 2, calyx. *Fig.* 3, corolla cut open, showing intermediate tufts of hairs between filament. *Fig.* 4, a stamen seen sideways to show its mode of attachment to the corolla, on which is seen one of the tufts that alternate with the stamens. *Fig.* 5, half of the calyx removed, to show the pistil surrounded at its base by its induvial cup of corolla: *all magnified.*

Plate 67.

A. a fragment of *Lycium tenue.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, calyx. *Fig.* 3, corolla cut open showing the stamens: *both magnified.*

B. a sprig of *Lycium pendulinum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the same. *Fig.* 3, corolla cut open. *Fig.* 4, pistil with half the calyx removed to show the cup-shaped remains of corolla: *all magnified.*

C. a piece of *Lycium pallidum.*

Fig. 1, a flower. *Fig.* 2, corolla cut open to show the stamens: *both nat. size.* *Fig.* 3, an anther seen before and behind. *Fig.* 4, the same after dehiscence. *Fig.* 5, transverse section of the last: *all magnified.* *Fig.* 6, pistil with half of the calyx removed, showing the persistent cup of corolla investing the ovary: *nat. size.* *Fig.* 7, stigma seen in front and sideways: *magnified.*

D. end of a branch of *Lycium fragosum*: *nat. size.*

Fig. 1, the calyx. *Fig.* 2, the corolla cut open, showing the stamens. *Fig.* 3, the pistil with half of the calyx removed: *all magnified.*

E. a piece of *Lycium implexum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla cut open. *Fig.* 4, the pistil with half the calyx cut away, to show the cupuliform remains of the corolla: *all magnified.*

F. a portion of *Lycium cestroides.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, corolla. *Fig.* 4, the same cut open to show the stamens and the cup-shaped base of the tube surrounding the ovary. *Fig.* 5, the pistil, with half the calyx cut away: *all magnified.*

PLATE 68.

A. a branchlet of *Lycium elongatum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the same. *Fig.* 3, calyx. *Fig.* 4, corolla cut open. *Fig.* 5, pistil, with remains of corolla: *all magnified.*

B. a fragment of *Lycium fuscum*: *nat. size.*

Fig. 1, corolla. *Fig.* 2, calyx. *Fig.* 3, corolla cut open. *Fig.* 4, pistil with half the calyx removed, to show the persistent base of corolla: *all magnified.*

C. a portion of *Lycium confertum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, calyx. *Fig.* 3, corolla, with its annular ring of hairs near the base. *Fig.* 4, corolla cut open. *Fig.* 5, pistil with half the calyx cut away, to show the persistent cup of corolla: *all magnified.*

D. a piece of *Lycium senticosum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the same. *Fig.* 3, calyx. *Fig.* 4, corolla cut open. *Fig.* 5, ovary surrounded by base of corolla, with half the calyx cut away: *all magnified.*

E. a fragment of *Lycium barbinodum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, calyx. *Fig.* 3, one of its 3-toothed lobes. *Fig.* 4, corolla cut open: *all magnified.* *Fig.* 5, anther seen from behind. *Fig.* 6, base of filament and mode of its insertion on the corolla: *both still more magnified.* *Fig.* 7, pistil, surrounded at base by the persistent cup of corolla: *magnified.*

F. a branchlet of *Lycium glomeratum*: *nat. size.*

Fig. 1, calyx. *Fig.* 2, corolla. *Fig.* 3, the same cut open to show the stamens. *Fig.* 4, pistil with half the calyx cut away, showing the cup-shaped base of corolla: *all magnified.*

Plate 69.

A. a small piece of *Lycium nodosum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the same: *magnified.* *Fig.* 3, the calyx. *Fig.* 4, the corolla cut open, to exhibit the stamens. *Fig.* 5, side view of one of the stamens, showing the mode of its insertion on the corolla. *Fig.* 6, the pistil, with half the calyx removed, the ovary being half enclosed within the persistent base of the corolla: *all magnified.*

B. a fragment of *Lycium vimineum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx: *magnified.* *Fig.* 3, the corolla. *Fig.* 4, the same cut open, showing the stamens and the intermediate tufts of hairs. *Fig.* 5, a stamen seen sideways, inserted on the corolla, with one of the intermediate tufts. *Fig.* 6, exterior view of an anther, with the manner of its attachment to the filament. *Fig.* 7, the pistil, with half of the calyx removed, the ovary being half enclosed in the persistent base of the corolla: *all magnified.*

C. a small specimen of *Lycium brevipes.*

Fig. 1, a flower: *nat. size.*

D. a portion of the lower part of a branch, and a piece of the upper flowering branchlet of *Lycium Barbarum*, from Kurdigras in Scinde.

Fig. 1, a flower: *nat. size.* *Fig.* 2, calyx. *Fig.* 3, corolla cut open, showing the stamens. *Fig.* 4, the pistil, its base being enveloped by the induvial base of the corolla: *all magnified.*

E. part of a branch of *Lycium Turcomanicum.*

Fig. 1. a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla cut open, showing the stamens. *Fig.* 4, the pistil, with the induvial base of the corolla: *all magnified.*

F. a branchlet of *Lycium Edgworthii.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla cut open to show the stamens. *Fig.* 4, the pistil, the ovary being half enclosed in the persistent base of the corolla: *all slightly magnified.*

Plate 70.

A. a piece of *Lycium Ruthenicum*.

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla cut open. *Fig.* 4, section of portion of the corolla, showing the mode of insertion of the filaments, with the intermediate tufts. *Fig.* 5, the ovarium seated in the induvial cup of the corolla: *all magnified.*

B. a branchlet of *Lycium vulgare*.

Fig. 1, flowers. *Fig.* 2, a corolla: *nat. size.* *Fig.* 3, the calyx. *Fig.* 4, the corolla cut open. *Fig.* 5, a stamen, showing the tuft of hairs near the base of the filament. *Fig.* 6, mode of insertion of the same on the corolla, with the intermediate tufts. *Fig.* 7, half of the calyx, with the pistil seated in the induvial base of the corolla. *Fig.* 8, the stigma: *all magnified.*

C. a portion of *Lycium Tataricum*.

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla cut open, showing the peculiar form of the stamens. *Fig.* 4, half of the calyx, with the pistil seated in the induvial cup of the corolla: *all magnified.*

D. part of a branch of *Lycium ferocissimum*.

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla cut open. *Fig.* 4, the glandular base of the filament. *Fig.* 5, half of the calyx, with the pistil seated in the induvial base of the corolla: *all more or less magnified.*

E. a piece of *Lycium capillare*.

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla. *Fig.* 4, the same cut open: *all magnified.*

F. a fragment of *Lycium floribundum*.

Fig. 1, a flower. *Fig.* 2, the calyx. *Fig.* 3, the corolla: *all nat. size.* *Fig.* 4, the calyx. *Fig.* 5, the corolla cut open. *Fig.* 6, half of the calyx, with the pistil seated in the induvial base of the corolla: *all magnified.*

Plate 71.

A. is *Lycium rachidocladum*.

Fig. 1, a flower: *nat. size.* *Fig.* 2, the same. *Fig.* 3, the corolla. *Fig.* 4, the same cut open. *Fig.* 5, side view of a stamen with the mode of its insertion on the corolla. *Fig.* 6, a filament pilose at its base. *Fig.* 7, half of the calyx with the entire pistil, showing the ovary seated in the persistent base of the corolla: *all magnified.*

B. is a branch of *Lycium tenuispinosum*.

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, one of its hairs. *Fig.* 4, the corolla. *Fig.* 5, the same cut open. *Fig.* 6, half of the calyx with the entire pistil, where the persistent base of the corolla is seen at its base: *all more or less magnified.*

C. a piece of *Lycium stolidum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the same. *Fig.* 3, the calyx. *Fig.* 4, the corolla cut open. *Fig.* 5, shows the hairy base of the filament and the mode of its insertion on the corolla. *Fig.* 6, half of the calyx and entire pistil with the ovary seated in the persistent base of the corolla: *all magnified.* *Fig.* 7, the fruit with the persistent calyx. *Fig.* 8, a seed seen front and sideways: *both nat. size.* *Fig.* 9, a seed. *Fig.* 10, a section of the same showing the embryo imbedded in albumen. *Fig.* 11, the embryo extracted: *all magnified.*

D. is *Lycium spinulosum.*

Fig. 1, a flower. *Fig.* 2, the calyx. *Fig.* 3, the corolla: *all nat. size.* *Fig.* 4, the calyx. *Fig.* 5, the corolla cut open. *Fig.* 6, a stamen with the tuft of hair near its base: *all magnified.*

E. a portion of *Lycium infaustum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla cut open, showing the tufts of hair on the filaments, with others intermediate upon the corolla. *Fig.* 4, a filament with its mode of insertion on the corolla: *all more or less magnified.*

F. part of a branch of *Lycium Carolinianum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla cut open. *Fig.* 4, base of filament with its mode of insertion on the corolla. *Fig.* 5, pistil in the bottom of the calyx, with the ovary seated in the persistent base of the corolla. *Fig.* 6, the stigma: *all more or less magnified.*

PLATE 72.

A. portion of a branch of *Lycium ignarum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla cut open to show the position of the stamens. *Fig.* 4, a stamen attached to a portion of the corolla seen sideways. *Fig.* 5, a filament seen in front, to show its basal gland: *all magnified.*

B. a branchlet of *Lycium filifolium.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, a corolla cut open, showing the stamens. *Fig.* 4, a filament attached to a portion of the corolla, seen sideways. *Fig.* 5, the same viewed in front, to show the basal gland: *all magnified.*

C. part of a branchlet of *Lycium salsum.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx with a tooth detached, shown on a larger scale. *Fig.* 3, the corolla cut open. *Fig.* 4, a filament attached to a portion of the corolla, seen sideways. *Fig.* 5, pistil seated within the induvial base of the corolla: *all magnified.*

D. a fragment of *Lycium Chilense.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, a section of the same, with the pistil seated in the induvial cup of the corolla. *Fig.* 4, a corolla, with its annular ring above the base. *Fig.* 5, the same cut open showing the stamens. *Fig.* 6, a filament

attached to a portion of the corolla, seen sideways. *Fig.* 7, the same seen in front, to show its basal gland: *all magnified.* *Fig.* 8, three of its seeds: *nat. size.* *Fig.* 9, longitudinal section of a seed. *Fig.* 10, its embryo extracted: *both magnified.*

E. a portion of *Lycium pubescens*.

Fig. 1, a flower: *nat. size.* *Fig.* 2, a calyx. *Fig.* 3, a corolla cut open. *Fig.* 4, lower portion of tube of corolla, with the stamens removed, to show the intermediate tufts of hair. *Fig.* 5, the pistil seated within the induvial cup of the corolla: *all magnified.* *Fig.* 6, a berry enclosed in its persistent calyx: *nat. size.*

F. a piece of *Lycium Patagonicum*.

Fig. 1, a corolla, with its annular tuft of hair near its base. *Fig.* 2, a calyx. *Fig.* 3, half of the same removed, to show the enclosed pistil seated in the induvial base of the corolla. *Fig.* 4, a corolla cut open, showing the stamens and intermediate tufts of hair. *Fig.* 5, a filament seen edgeways, attached to a portion of the corolla, on which one of the intermediate tufts is shown, as well as the external hairy ring. *Fig.* 6, the same seen in front, to show its basal gland: *all magnified.*

Plate 73.

A. a portion of *Lycium scoparium*: *nat. size.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the corolla cut open. *Fig.* 3, the calyx. *Fig.* 4, the pistillum. *Fig.* 5, a stamen: *all magnified.*

B. a young branch of *Lycium scoparium*, var. *lineare*: *nat. size.*

Fig. 1, the calyx. *Fig.* 2, the corolla cut open. *Fig.* 3, two of the stamens with a portion of the corolla, seen in front. *Fig.* 4, the same, seen edgeways. *Fig.* 5, half of the calyx removed, with the enclosed pistil seated in the induvial cup of the corolla: *all magnified.*

C. a branchlet of *Lycium scoparium*, var. *confertifolium*: *nat. size.*

Fig. 1, a calyx. *Fig.* 2, a corolla. *Fig.* 3, half of the calyx removed, showing the enclosed pistil: *all magnified.*

D. a piece of *Lycium scoparium*, var. *divaricatum*: *nat. size.*

Fig. 1, a calyx. *Fig.* 2, a corolla. *Fig.* 3, the same cut open. *Fig.* 4, a stamen detached, to show its basal gland: *all magnified.*

E. a fragment of *Lycium scoparium*, var. *affine*.

Fig. 1, a flower: *nat. size.* *Fig.* 2, a calyx. *Fig.* 3, a corolla cut open. *Fig.* 4, basal portion of the corolla, with the stamens removed, to show the intermediate basal tufts.

F. a portion of *Lycium Grevilleanum*, in fruit.

Fig. 1, a flower: *nat. size.* *Fig.* 2, a calyx. *Fig.* 3, corolla cut open. *Fig.* 4, a stamen detached, to show its basal gland: *all more or less magnified.*

Plate 74.

A. part of a branchlet of *Lycium erosum*.

Fig. 1, a flower. *Fig.* 2, the corolla: *both nat. size.* *Fig.* 3, a calyx. *Fig.* 4, the corolla cut open, showing the position of the stamens. *Fig.* 5, a filament with its basal gland. *Fig.* 6, the pistil: *all more or less magnified.*

B. is *Lycium Gilliesianum* in fruit.

C. represents *Coleophora gemmiflora*.

Fig. 1, is a raceme taken from the trunk of a very lofty tree: *nat. size.* *Fig.* 2, one of the bracts shown sideways. *Fig.* 3, a front view of the same. *Fig.* 4, the perigonium in bud. *Fig.* 5, the same expanded. *Fig.* 6, the same cut open to show the position of the stamens, and the enclosed pistil. *Fig.* 7, stamens seen in different positions, to show the manner of dehiscence of the anthers. *Fig.* 8, a globule of pollen. *Fig.* 9, the pistil, with the perigonium cut open and thrown back, to show the mode of their attachment at the base. *Fig.* 10, the pistil removed, showing the stipitate ovary surrounded at base by its 4-lobed funnel-shaped nectary. *Fig.* 11, the nectary with four unequal lobes. *Fig.* 12, the pistil upon its long stipes, and a portion of the wall of the ovary cut away to show its ovule suspended in its single cell. *Fig.* 13, the ovule extracted: *all more or less magnified.*

Plate 75.

Shows a drawing of *Triguera ambrosiaca* in flower and in fruit.

Fig. 1, a flower, with its pedicel seated in the articulated joint of the main peduncle. *Fig.* 2, the corolla. *Fig.* 3, the same cut open to show the stamens. *Fig.* 4, the pistil with the calyx thrown back: *all nat. size.* *Fig.* 5, the stamens seen in front, showing the manner of their insertion upon the free annular ring, with a portion of the base of the corolla to which it is there attached. *Fig.* 6, a stamen seen from the back. *Fig.* 7, a front view of the same, to show the mode of its dehiscence. *Fig.* 8, the stigma and portion of the style: *all more or less magnified.* *Fig.* 9, the ripe capsule invested by the persistent calyx. *Fig.* 10, the same with the calyx removed, showing the irregular mode of its laceration into two halves, not by the usual mode of separation into distinct valves. *Fig.* 11, the lower half of the same with the seeds removed, to show the dissepiment. *Fig.* 12, two of the seeds: *all nat. size.* *Fig.* 13, a seed. *Fig.* 14, the same, seen edgeways. *Fig.* 15, the same, with half of the testa removed. *Fig.* 16, the albumen extracted. *Fig.* 17, a section of the same, showing the embryo enclosed. *Fig.* 18, the embryo extracted.

Plate 76.

Represents *Atropa acuminata*.

Fig. 1, a flower-bud seen from above, to show the mode of æstivation of the corolla. *Fig.* 2, a flower fully blown. *Fig.* 3, the corolla cut open to show the position of the stamens: *all nat. size.* *Fig.* 4, a stamen: *magnified.* *Fig.* 5, the pistil with the calyx thrown back, to show the hypogynous gland at the base of the ovary: *nat. size.* *Fig.* 6, the stigma: *magnified.* *Fig.* 7, a transverse section of the ovary showing the mode of

placentation: *magnified.* *Fig.* 8, the ripe fruit with its persistent calyx. *Fig.* 9, some of its seeds: *both nat. size.* *Fig.* 10, a seed. *Fig.* 11, a section of the same, showing the embryo imbedded in albumen. *Fig.* 12, the embryo extracted.

Plate 77.

A. is a figure of *Withania frutescens.*

Fig. 1, a flower. *Fig.* 2, the corolla. *Fig.* 3, the same cut open, showing the insertion of the stamens. *Fig.* 4, the calyx. *Fig.* 5, the pistil: *all nat. size* *Fig.* 6, the same. *Fig.* 7, two of the stamens: *both magnified.* *Fig.* 8, the persistent augmented calyx containing the fruit. *Fig.* 9, the berry taken out of the calyx. *Fig.* 10, a transverse section of the same, with an included seed, showing its bilocular structure. *Fig.* 11, a seed seen in front and edgeways: *all nat. size.* *Fig.* 12, the same. *Fig.* 13, section of the same, showing the embryo imbedded in albumen: *both magnified.*

B. is *Withania aristata.*

Fig. 1, a flower. *Fig.* 2, the corolla. *Fig.* 3, the calyx. *Fig.* 4, the corolla cut open: *all nat. size.* *Fig.* 5, two of the stamens. *Fig.* 6, the stigma, with a portion of the style: *both magnified.* *Fig.* 7, the berry seated in the augmented persistent calyx. *Fig.* 8, the same removed. *Fig.* 9, a transverse section of the same. *Fig.* 10, seeds seen in different positions: *all nat. size.* *Fig.* 11, a seed. *Fig.* 12, section of the same, showing the embryo imbedded in albumen. *Fig.* 13, the embryo extracted: *all magnified.*

Plate 78.

Is a representation of *Anisodus luridus.*

Fig. 1, a flower in bud, to show the mode of its æstivation. *Fig.* 2, the same expanded. *Fig.* 3, the corolla. *Fig.* 4, the same cut open, showing the insertion of the stamens: *all nat. size.* *Fig.* 5, the stamens seen in different positions: *somewhat magnified.* *Fig.* 6, the pistil: *nat. size.* *Fig.* 7, the same, exhibiting the lobed fleshy hypogynous disk that invests the ovary. *Fig.* 8, longitudinal section of the same: *both magnified.* *Fig.* 9, the berry enclosed in the persistent calyx. *Fig.* 10, the same with the calyx removed. *Fig.* 11, a transverse section of the same, showing the mode of its placentation. *Fig.* 12, the fleshy berry become dried and coriaceous, showing the mode of its opercular dehiscence, and also the thick coriaceous dissepiment. *Fig.* 13, seeds: *all nat size.* *Fig.* 14, a seed seen in front and sideways, showing the position of the hilum. *Fig.* 15, a section of the same, with the embryo imbedded in albumen: *all magnified.*

Plate 79.

A. shows *Hyoscyamus pictus.*

Fig. 1, is a flower. *Fig.* 2, the calyx. *Fig.* 3, the corolla. *Fig.* 4, the same cut open: *all nat. size.* *Fig.* 5, a stamen seen edgeways, to show the mode of its insertion on the corolla. *Fig.* 6, the transverse section of an anther: *both magnified.* *Fig.* 7, the pistil with the calyx thrown back: *nat. size.* *Fig.* 8, the ovary, showing the large epigynous gland, and the articulation of the style in a cavity in its summit. *Fig.* 9, a longitudinal

section of the same, exhibiting also the mode of placentation. *Fig.* 10, a transverse section of the same: *all magnified.* *Fig.* 11, a capsule in the persistent and augmented calyx, half of which has been cut away. *Fig.* 12, the same with the calyx removed, showing its opercular summit. *Fig.* 13, the same, with the operculum, formed from the epigynous gland of the ovary, separated by a circumscissile line of dehiscence; the dissepiment which divides the capsule into two cells is there seen. *Fig.* 14, the same reversed, to show the manner in which it has separated from the dissepiment. *Fig.* 15, seeds: *all nat. size.* *Fig.* 16, a seed with its somewhat lateral hilum. *Fig.* 17, a section of the same, with the embryo imbedded in albumen. *Fig.* 18, the embryo separated: *all magnified.*

B. is an analysis of *Mandragora officinarum.*

Fig. 1, a flower. *Fig.* 2, the calyx. *Fig.* 3, the corolla cut open: *all nat. size.* *Fig.* 4, the stamens seen before and behind, and sideways as affixed to the corolla; the section of the anther is also given: *magnified.* *Fig.* 5, the pistil, with the calyx thrown back: *nat. size.* *Fig.* 6, the ovary with its hypogynous gland. *Fig.* 7, transverse section of the same, showing the mode of placentation. *Fig.* 8, the stigma: *all magnified.* *Fig.* 9, the berry enclosed in the persistent calyx. *Fig.* 10, the same with the calyx removed. *Fig.* 11, seeds: *all nat. size.* *Fig.* 12, a seed with half of the testa removed. *Fig.* 13, the albumen. *Fig.* 14, section of the same with the embryo enclosed. *Fig.* 15, the embryo extracted: *all magnified.*

Plate 80.

Is a drawing of *Physochlæna rubricaulis* made from better specimens grown a year subsequent to the description given in the text.

Fig. 1, a flower: *nat. size.* *Fig.* 2, the corolla. *Fig.* 3, the same cut open. *Fig.* 4, stamens seen before and behind. *Fig.* 5, the pistil with its hypogynous disk: *all magnified.* *Fig.* 6, the capsule enclosed in the persistent calyx. *Fig.* 7, the same removed from the calyx. *Fig.* 8, the same with its operculum separated. *Fig.* 9, seeds: *all nat. size.* *Fig.* 10, a seed with half of the testa removed. *Fig.* 11, a section of the albumen, with the enclosed embryo. *Fig.* 12, the embryo removed: *all magnified.*

Plate 81.

Represents *Scopolia Carnioliaca.*

Fig. 1, a flower in bud, *nat. size*, to show the plication of the tube and the quincuncial mode of imbrication of its teeth in æstivation. *Fig.* 2, the flower expanded. *Fig.* 3, the corolla. *Fig.* 4, the same cut open: *all nat. size.* *Fig.* 5, anthers seen before and behind: *magnified.* *Fig.* 6, the pistil with its hypogynous disk: *nat. size.* *Fig.* 7, longitudinal section of the ovary. *Fig.* 8, the stigma. *Fig.* 9, one of the articulated hairs of the pubescence: *all magnified.*

Plate 82.

Is a drawing of *Anthocercis viscosa.*

Fig. 1, a flower in bud. *Fig.* 2, a diagram giving the disposition of its several parts: the outer whorl consists of the five teeth of the calyx; the second, the segments of the

corolla, showing the different manner of their involution in æstivation; the third, the position of the one sterile and the four fertile stamens, with the ovary in the centre. *Fig.* 3, the corolla cut open while yet in æstivation: *all nat. size.* *Fig.* 4, one of the extrorse stamens seen in front, from behind, and sideways. *Fig.* 5, grains of pollen. *Fig.* 6, the stigma. *Fig.* 7, a transverse section of the ovary, showing its manner of placentation: *all more or less magnified.* *Fig.* 8, the capsule in the state of dehiscence, in the persistent calyx. *Fig.* 9, the dissepiment, always incomplete towards the summit, with its placenta. *Fig.* 10, seeds: *all nat. size.* *Fig.* 11, a seed. *Fig.* 12, a section of the albumen, with the embryo enclosed. *Fig.* 13, the embryo extracted: *all magnified.*

Plate 83.

A. is *Anthocercis littorea.*

Fig. 1, a flower. *Fig.* 2, the calyx. *Fig.* 3, the corolla. *Fig.* 4, the pistil. *Fig.* 5, the corolla cut open: *all nat. size.* *Fig.* 6, stamens seen before and behind: *magnified.* *Fig.* 7, the capsule opened, in its persistent calyx. *Fig.* 8, transverse section of the same. *Fig.* 9, a seed: *all nat. size.* *Fig.* 10, a seed: *magnified.*

B. is *Anthocercis ilicifolia.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the corolla cut open: *magnified.* *Fig.* 3, stamens seen before and behind: *more magnified.* *Fig.* 4, capsule: *nat. size.* *Fig.* 5, pistil: *magnified.*

C. is *Anthocercis gracilis.*

Fig. 1, a flower. *Fig.* 2, the corolla: *both nat. size.* *Fig.* 3, the corolla cut open. *Fig.* 4, two of the stamens. *Fig.* 5, the pistil, with the calyx thrown back. *Fig.* 6, the hypogynous disk at the base of the ovary: *all magnified.* *Fig.* 7, the capsule and persistent calyx. *Fig.* 8, the capsule with one of the valves thrown back, to show the dissepiment in its position. *Fig.* 9, a seed. *Fig.* 10, the dissepiment seen in front and sideways: *all nat. size.*

D. is *Anthocercis genistoides.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla. *Fig.* 4, the same cut open. *Fig.* 5, a stamen. *Fig.* 6, the pistil with half of the calyx removed: *all magnified.*

Plate 84.

A. is a sketch of *Cyphanthera frondosa.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla. *Fig.* 4, the same cut open to show its extrorse stamens. *Fig.* 5, a stamen before and after dehiscence: *all magnified.*

B. is *Cyphanthera Tasmanica.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the corolla. *Fig.* 3, the same cut open: *both magnified.* *Fig.* 4, the capsule in its persistent calyx. *Fig.* 5, seeds: *both nat. size.*

C. is *Cyphanthera cuneata.*

Fig. 1, the termination of a flowering branch in bud, to show the mode of articulation of the pedicels out of a thick cup: *magnified.* *Fig.* 2, a flower: *nat. size.* *Fig.* 3, the same. *Fig.* 4, the calyx. *Fig.* 5, the corolla cut open. *Fig.* 6, the pistil with its hypogynous disk: *all magnified.*

D. is *Cyphanthera albicans.*

Fig. 1, a flower: *nat. size.*

Plate 85.

A. is a drawing of *Cyphanthera tomentosa.*

B. is *Cyphanthera scabrella.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the same. *Fig.* 3, the corolla cut open. *Fig.* 4, the pistil. *Fig.* 5, the ovary seated in its free hypogynous disk, and showing the articulated base of the style: *all magnified.*

C. is *Cyphanthera ovalifolia.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the same. *Fig.* 3, the corolla cut open. *Fig.* 4, the pistil, with the calyx thrown back: *all magnified.* *Fig.* 5, the capsule in the persistent calyx. *Fig.* 6, the same in the dehiscent state, removed from the calyx. *Fig.* 7, the dissepiment incomplete at the summit. *Fig.* 8, a seed: *all nat. size.* *Fig.* 9, a seed. *Fig.* 10, the albumen. *Fig.* 11, the embryo extracted, seen in two different positions: *all magnified.*

D. is *Cyphanthera microphylla.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the same. *Fig.* 3, the calyx with the pistil enclosed. *Fig.* 4, the corolla cut open. *Fig.* 5, the ovary seated in its free hypogynous disk, and crowned by an epigynous 4-grooved gland, into which the style is articulated. *Fig.* 6, the hypogynous disk. *Fig.* 7, a transverse section of the ovary, to show the mode of placentation: *all magnified.* *Fig.* 8, the capsule in its persistent calyx. *Fig.* 9, a seed: *both nat. size.* *Fig.* 10, the capsule in the dehiscent state. *Fig.* 11, the dissepiment incomplete at its summit: *both magnified.*

Plate 86.

Is a drawing of *Anthotroche pannosa.*

Fig. 1, a flower, with its respective bract. *Fig.* 2, the same with the corolla removed. *Fig.* 3, the corolla: *all nat. size.* *Fig.* 4, the calyx. *Fig.* 5, the same more expanded to show the pistil. *Fig.* 6, the corolla seen sideways. *Fig.* 7, a flower fully expanded. *Fig.* 8, the corolla cut open to show the position of the extrorse stamens. *Fig.* 10, the stamens seen from before, behind, and sideways, before and after dehiscence. *Fig.* 11, the pistil with the ovary surrounded by its adnate hypogynous disk. *Fig.* 12, a transverse section of the ovary: *all more or less magnified.* *Fig.* 13, the capsule in its persistent calyx. *Fig.* 14, the same removed from the calyx. *Fig.* 15, the incomplete dissepiment: *all nat. size.* *Fig.* 16, the same, showing the placentary attachment of the seeds. *Fig.* 17, the same seen sideways: *both magnified.* *Fig.* 18, a seed: *nat. size.* *Fig.* 19, the same. *Fig.* 20, the albumen: *both magnified.* *Fig.* 21, articulated hairs of the pubescence: *highly magnified.*

Plate 87.

Is a representation of *Duboisia myoporoides.*

Fig. 1, a flower: *nat. size.* *Fig.* 2, the calyx. *Fig.* 3, the corolla, showing the line of its circumscissile rupture. *Fig.* 4, the pistil with half of the calyx cut away, showing the ovary seated in the persistent base of the corolla. *Fig.* 5, the corolla cut open, showing the relative position of the fertile and sterile stamens. *Fig.* 6, an extrorse stamen seen from behind and before: *all magnified.* *Fig.* 7, the fruit in its persistent calyx. *Fig.* 8, a transverse section of the same. *Fig.* 9, seeds: *all nat. size.* *Fig.* 10, a seed. *Fig.* 11, a longitudinal section of the same, showing the embryo imbedded in albumen. *Fig.* 12, the embryo seen in front and sideways: *all magnified.*

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Brachistus lanceæfolius.

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Saracha glandulosa.

Details of

Physalis Peruviana.

Physalis gracilis.

Nectouxia bella.

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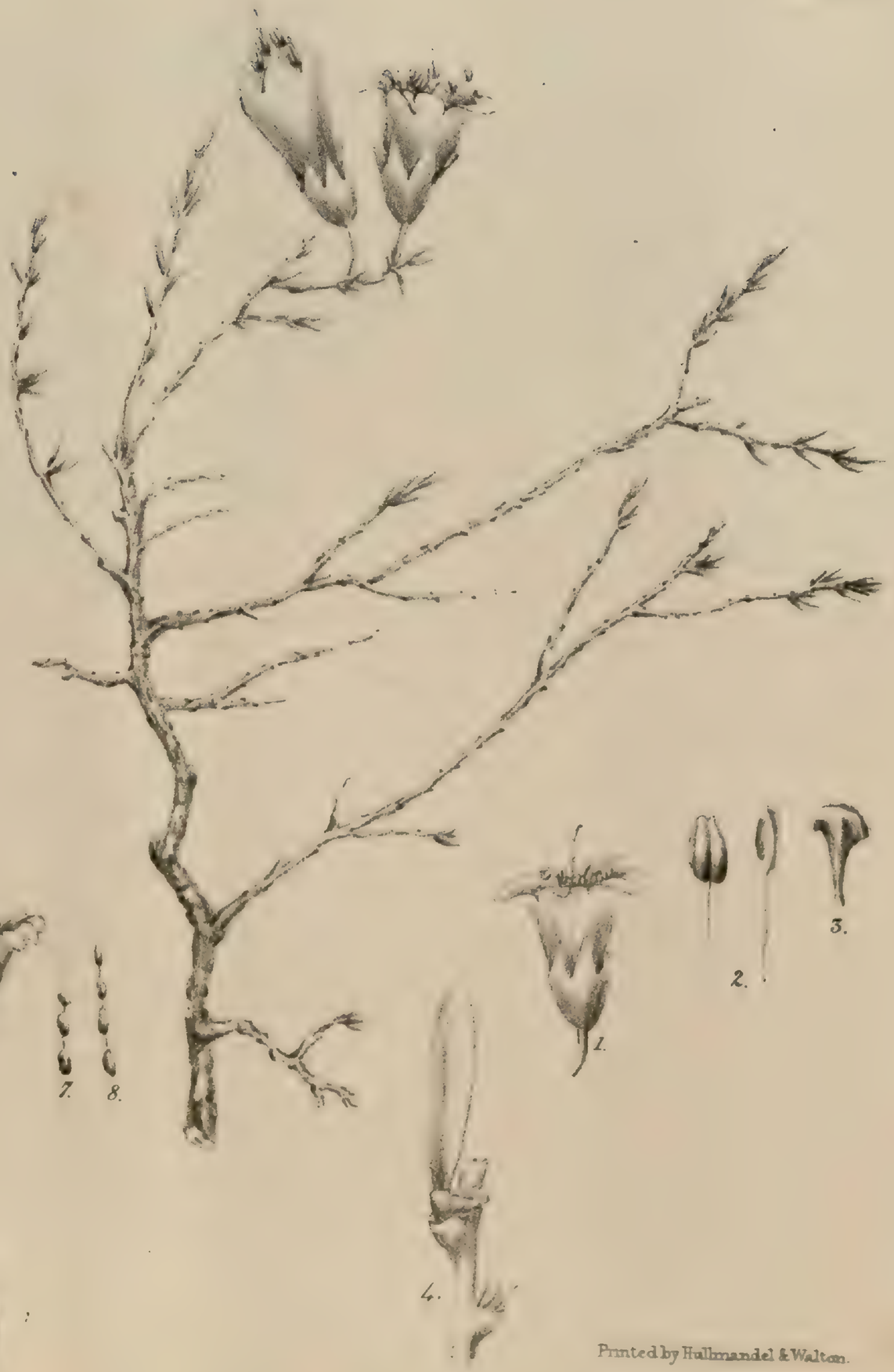
Phrodus Bridgesii.

Phrodus microphyllus.



Phrodus nodosus.

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Nicandra physaloides.

1

2

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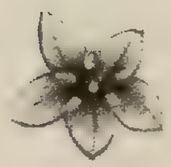
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14

J. Miers, lith.

Printed by Hullmandel & Walton.

Cliocarpus Gardneri.

J. Miers, lith.

Printed by Hullmandel & Walton

Marckea coccinea

drawn from Nature by J. Fisher and J. Hoskyns-Abrahall

J. Mieve, lithog.

Printed by Hullmandel & Walton

Juanulloa Panamensis.

J. Miers, lith.

Printed by Hullmandel & Walton

Sarcophysa speciosa.

Printed by Hullmandel & Walton

J Miers lithog

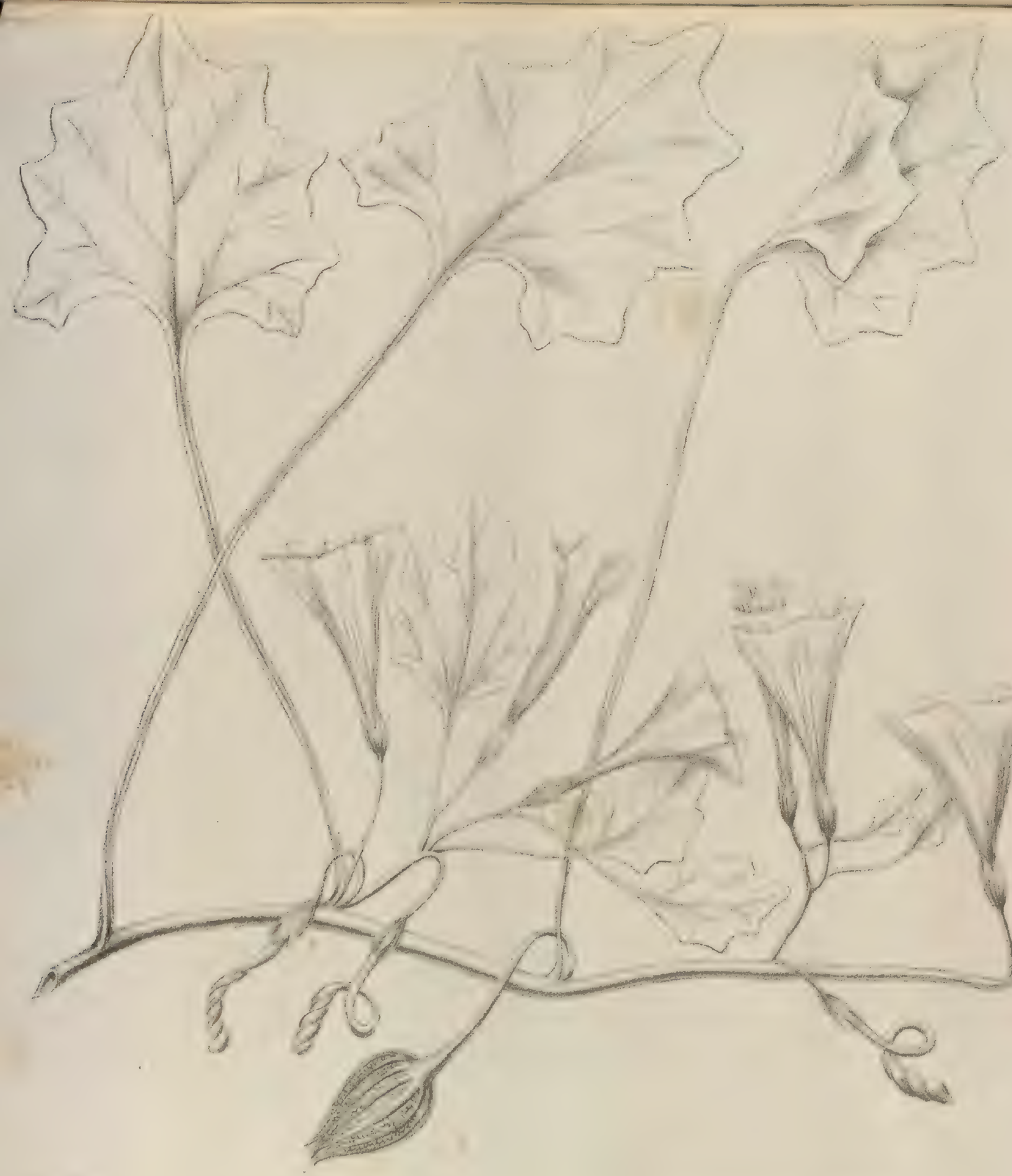
Ectozoma Pavonii

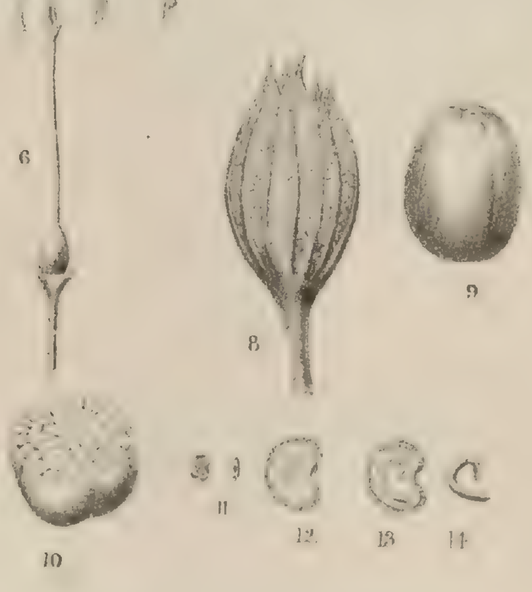
details of C prostrata

Printed by Hullmandel & Walton.

J.Miers lithog.

Cacabus Nolanoides

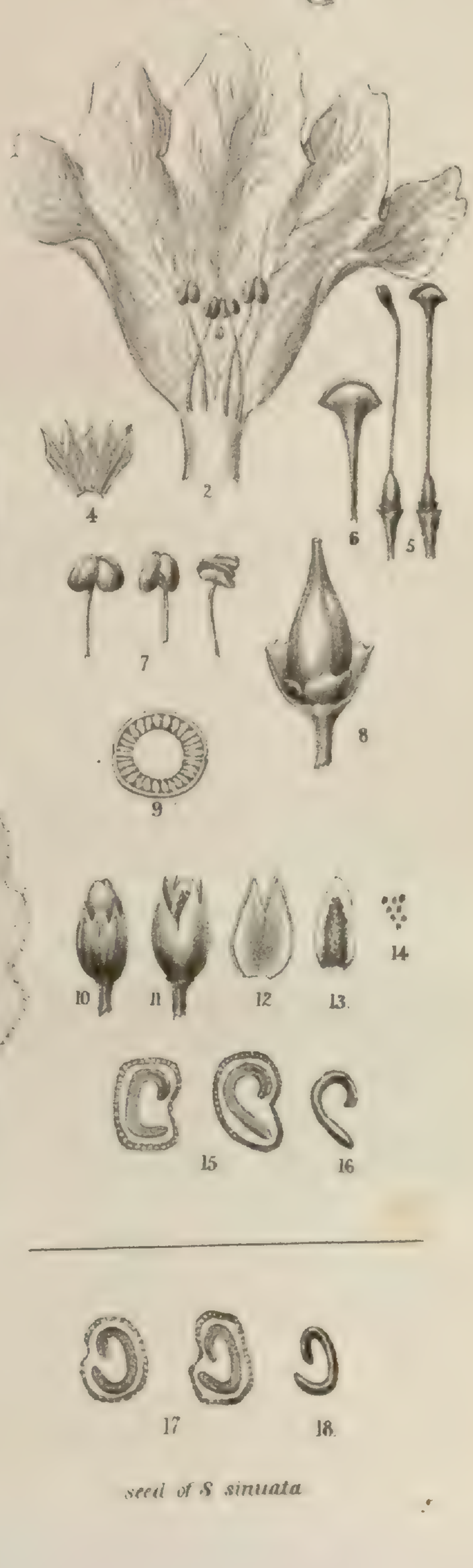




J.Miers lithog.

Printed by Hullmandel & Walton.

Thinogeton Miersii.



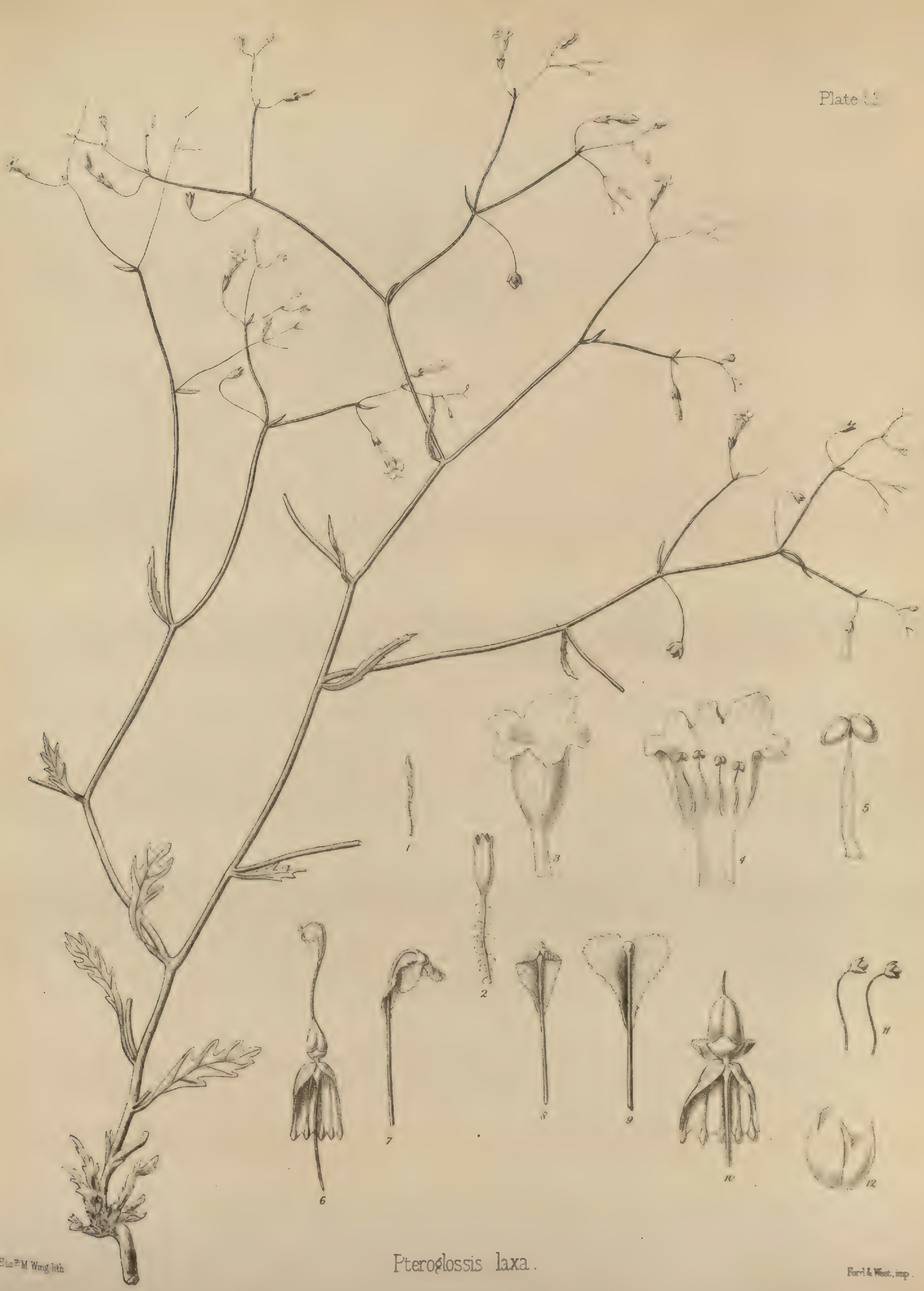
seed of S sinuata

J.Miers lithog

Printed by Hullmandel & Walton

Salpiglossis purpurea

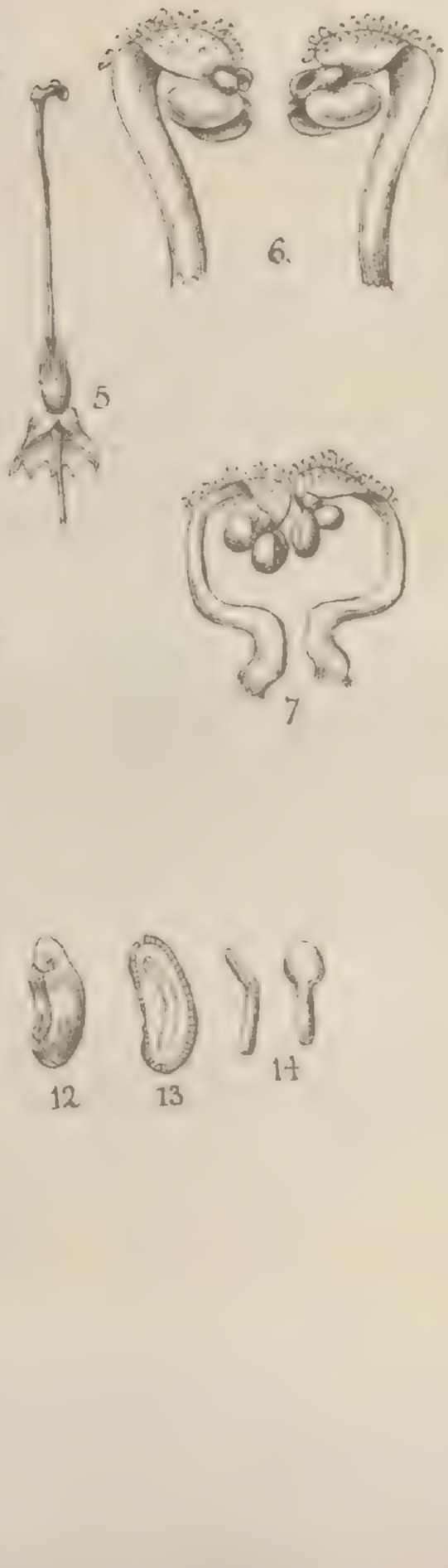
Plate 12



Pteroglossis laxa.

Eliz.th M Wing lith

Ford & West, imp.



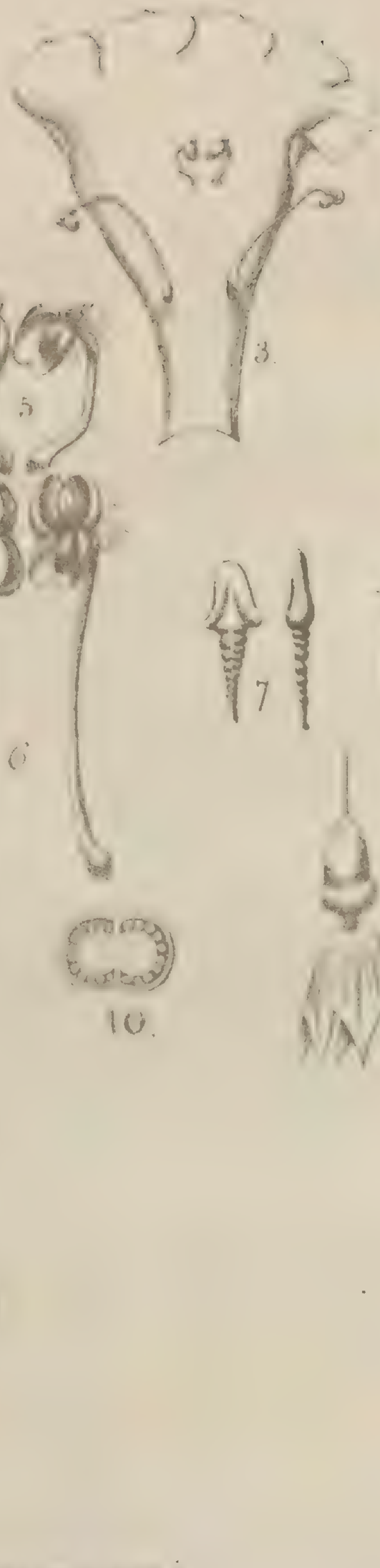
J.Miers del.

Browallia tenella.

Plate 55.

1

2


3

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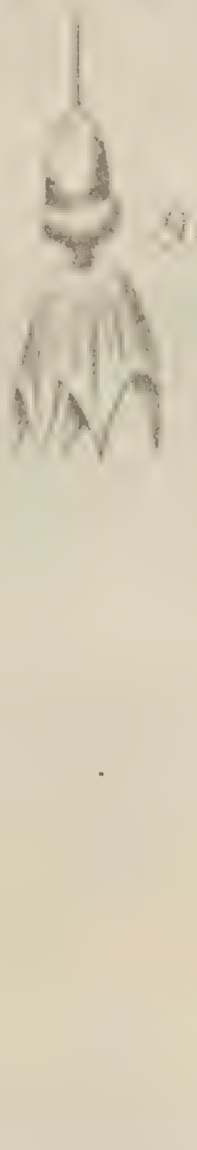
10.


9.

J Miers del.

Streptosolen Jamesoni

Plate 56

4.

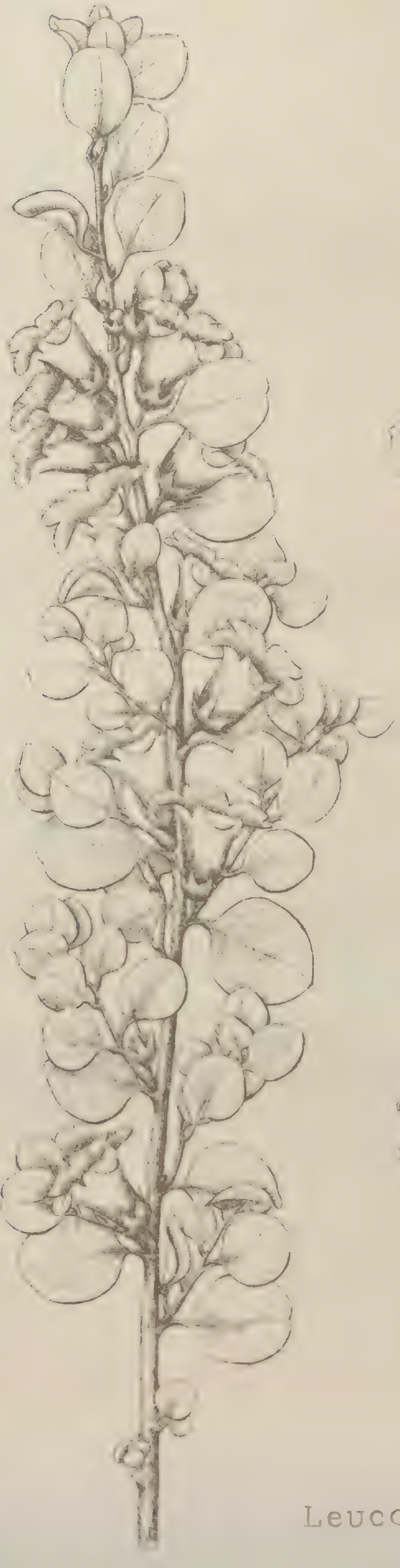
5.

B. undulata.

J Miers del'

Brunfelsia nitida.

Margaranthus tatuhi.



J.Miers . del.

Leucophyllum campanulatum.

J.Miers.del.

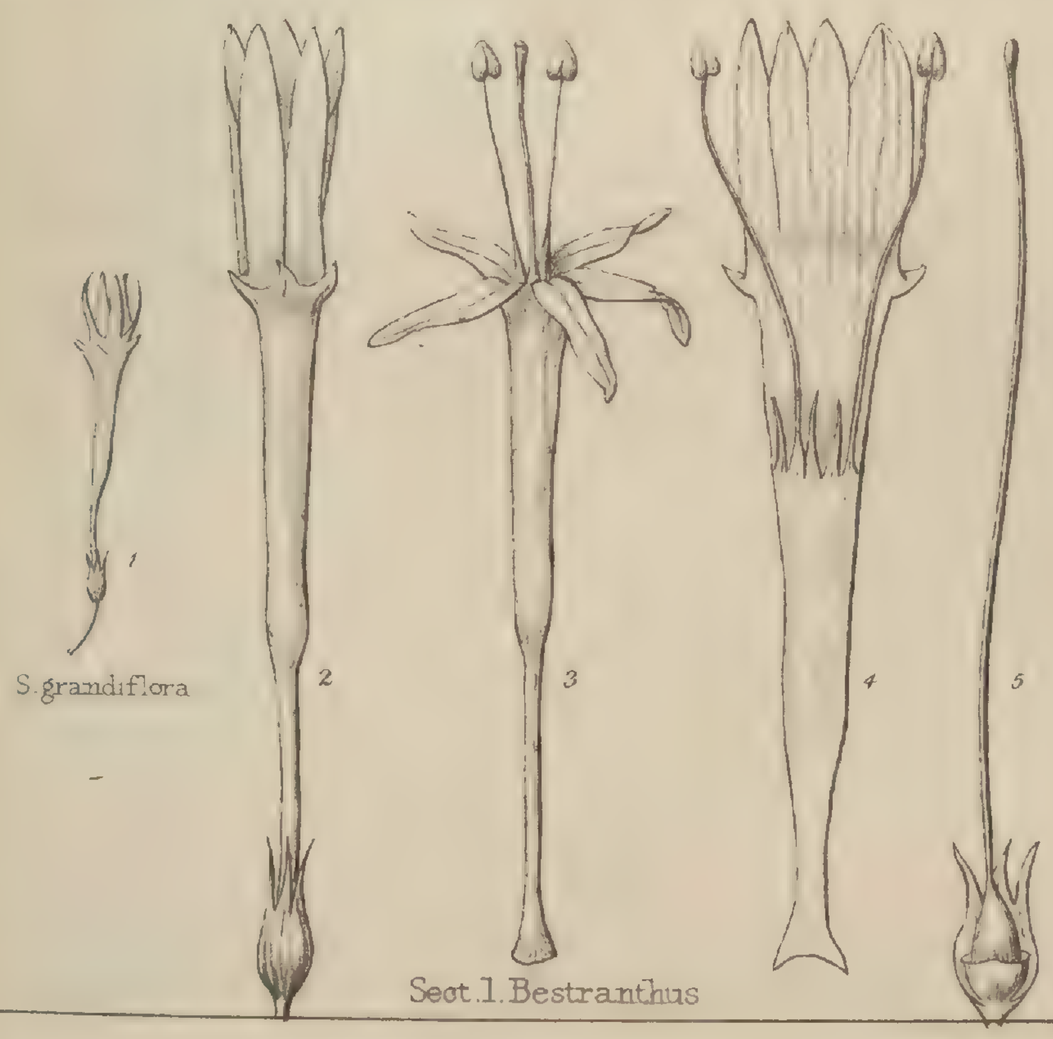
Franciscea capitata.

Plate 69

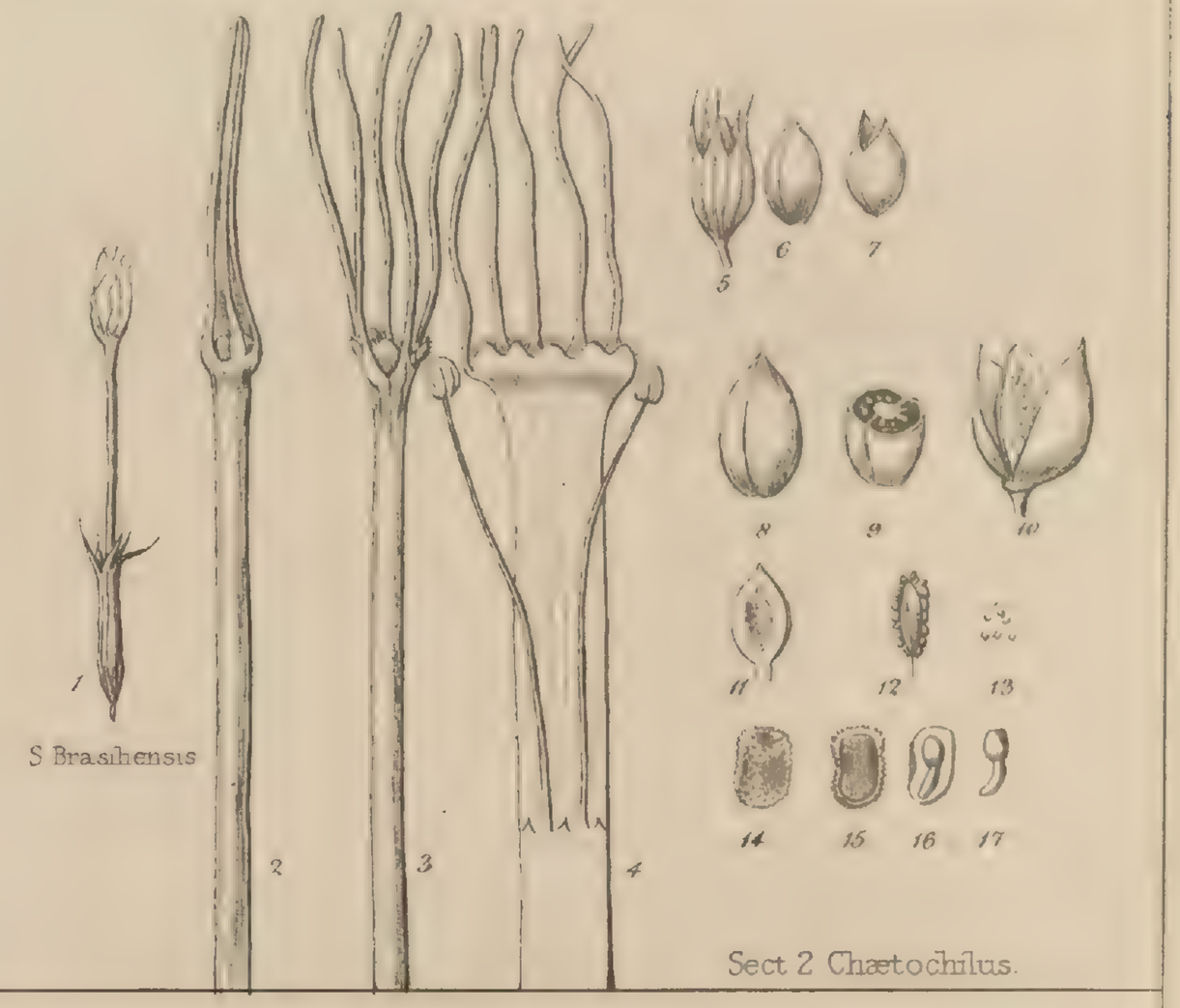
J.Moore del.

Pionandra pinnata.

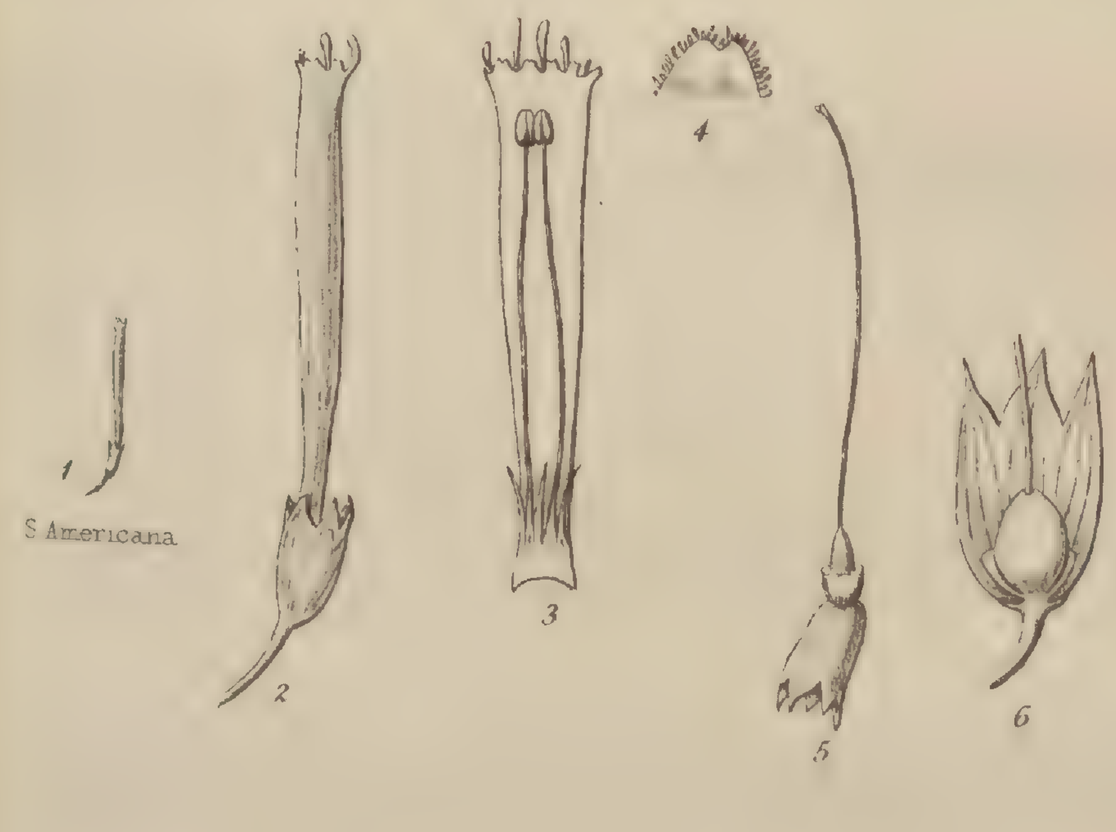
Tessarandra Fluminensis.



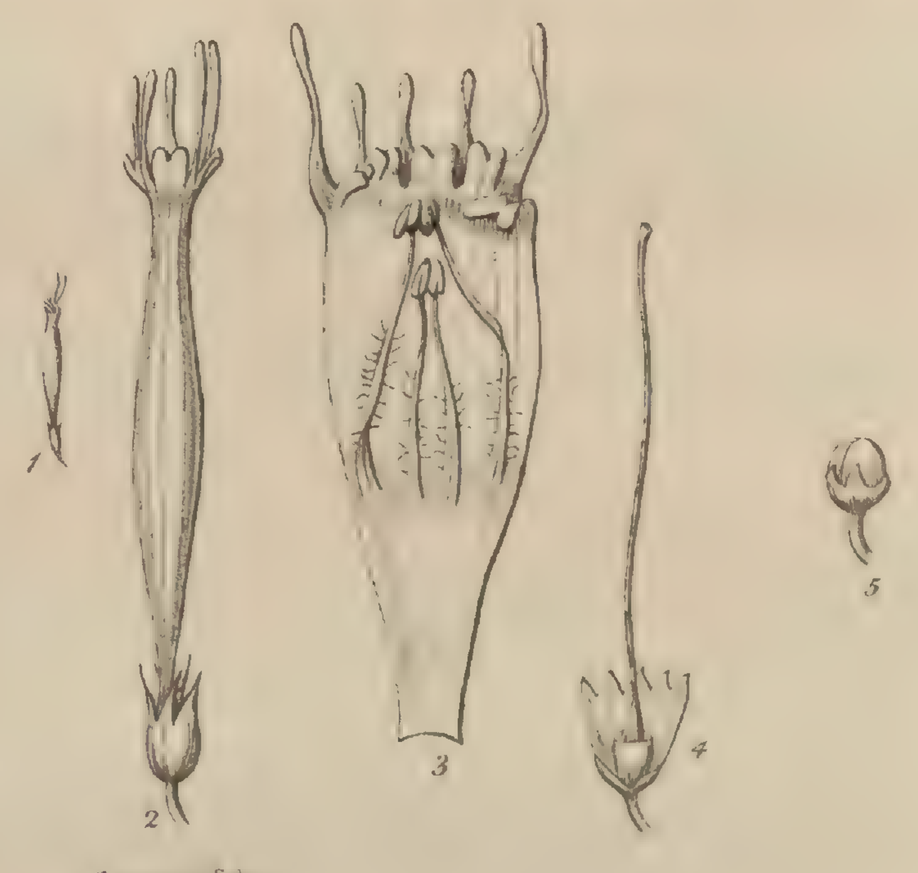
Sect. 1. Bestranthus



Sect 2 Chætochilus.



Sect. 3 Huschwenkia



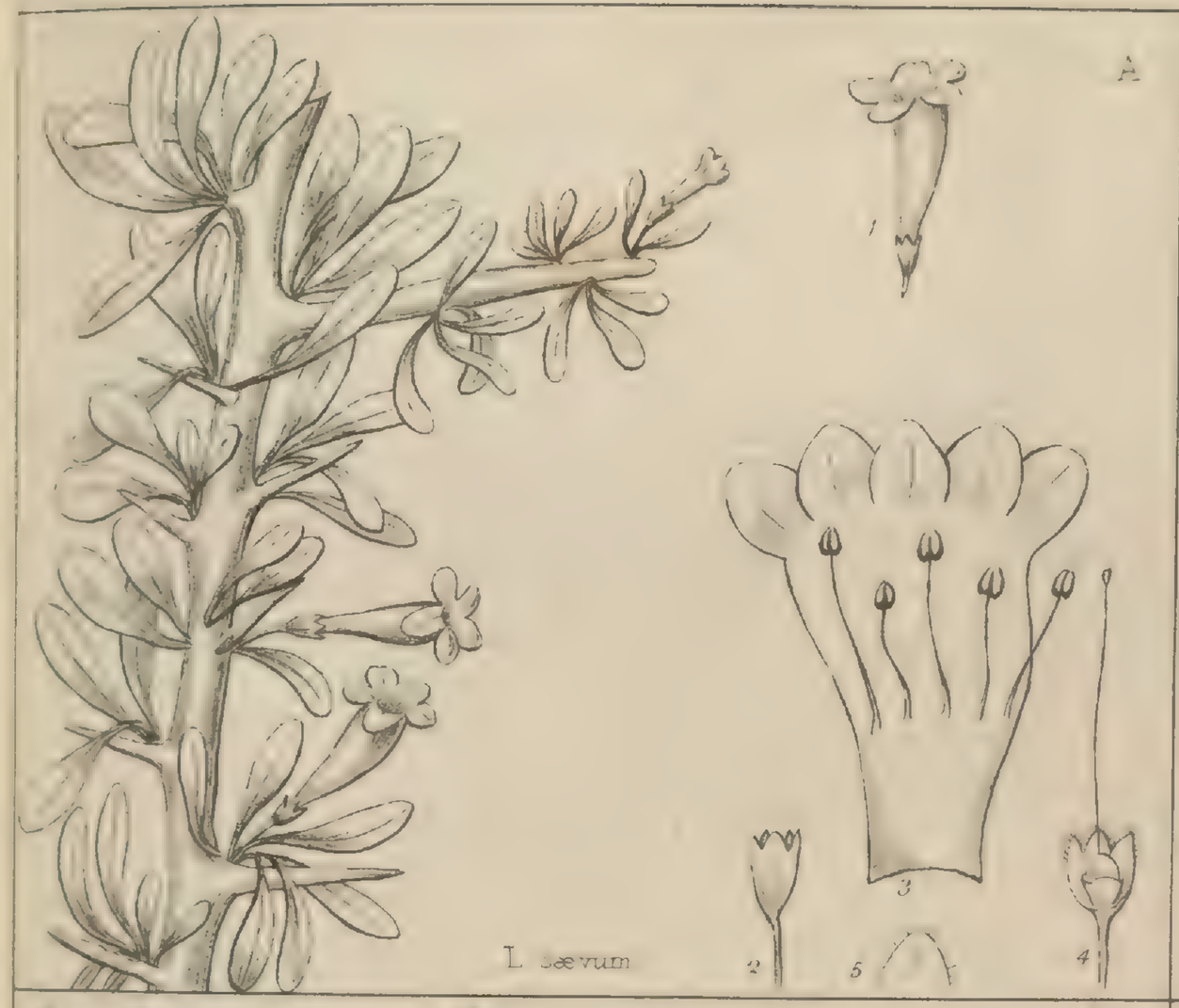
Sect 4 Brachyhetus

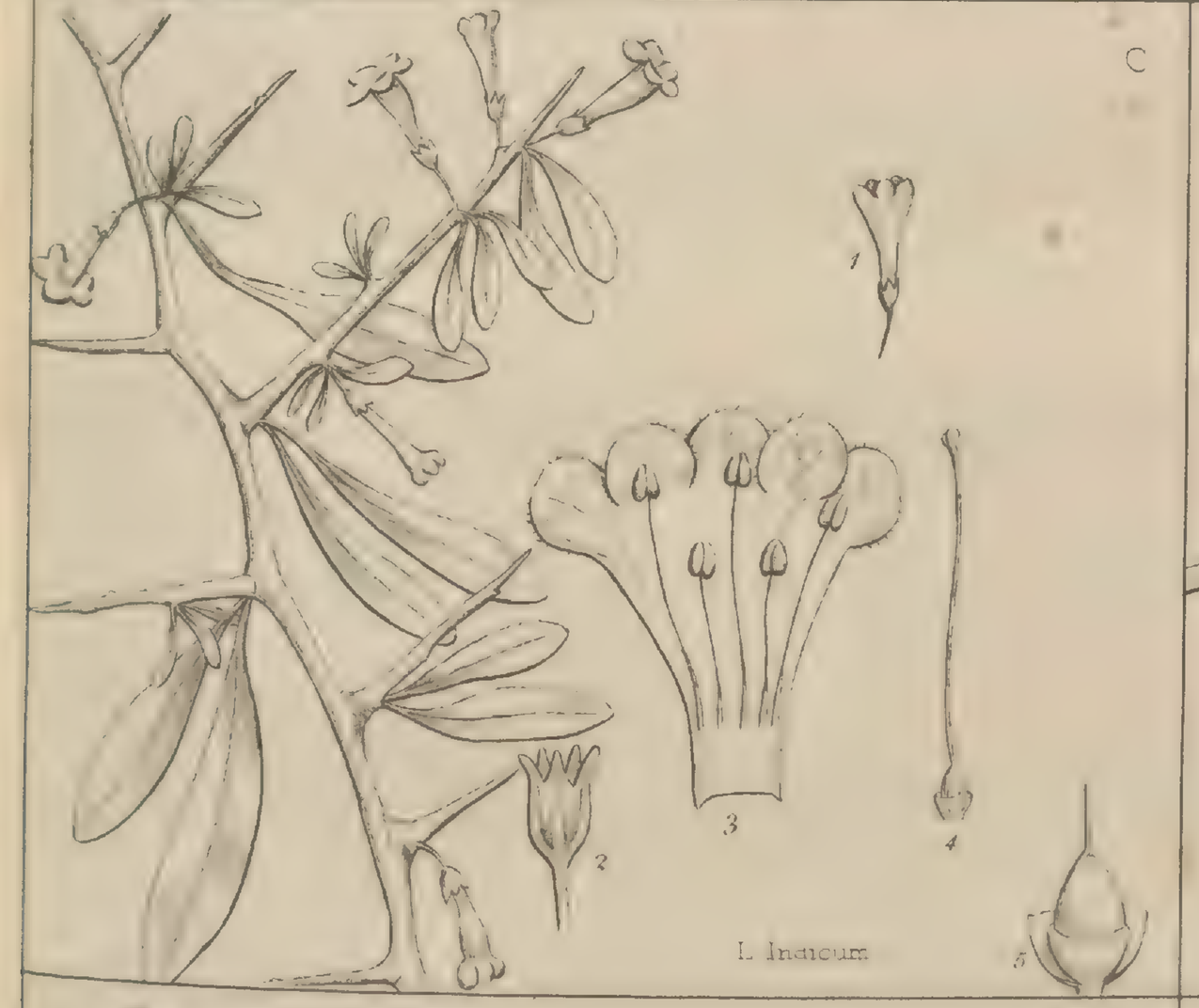
Sect 5 Cardiomera

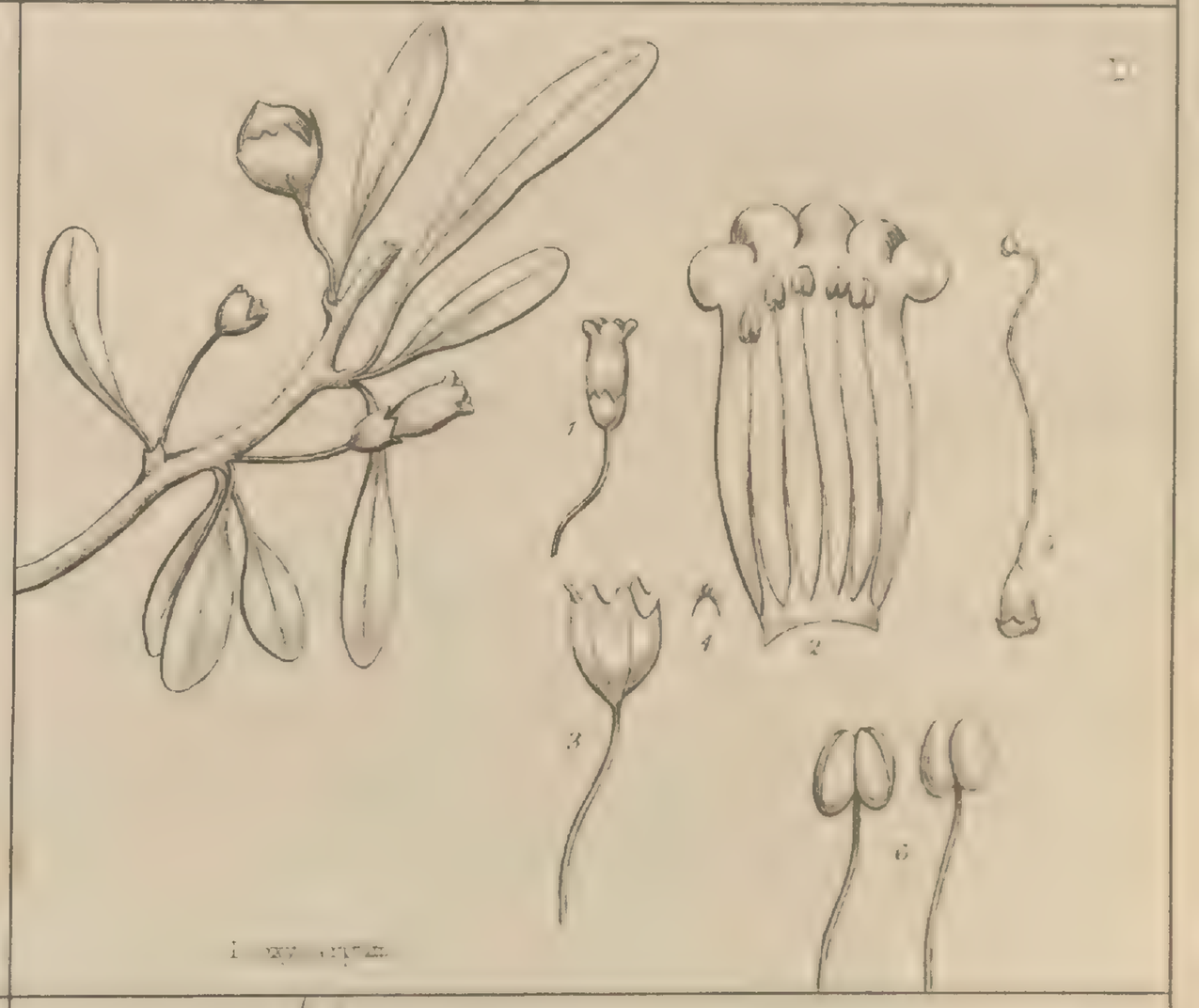
Mers del Eliz M Wmg hth

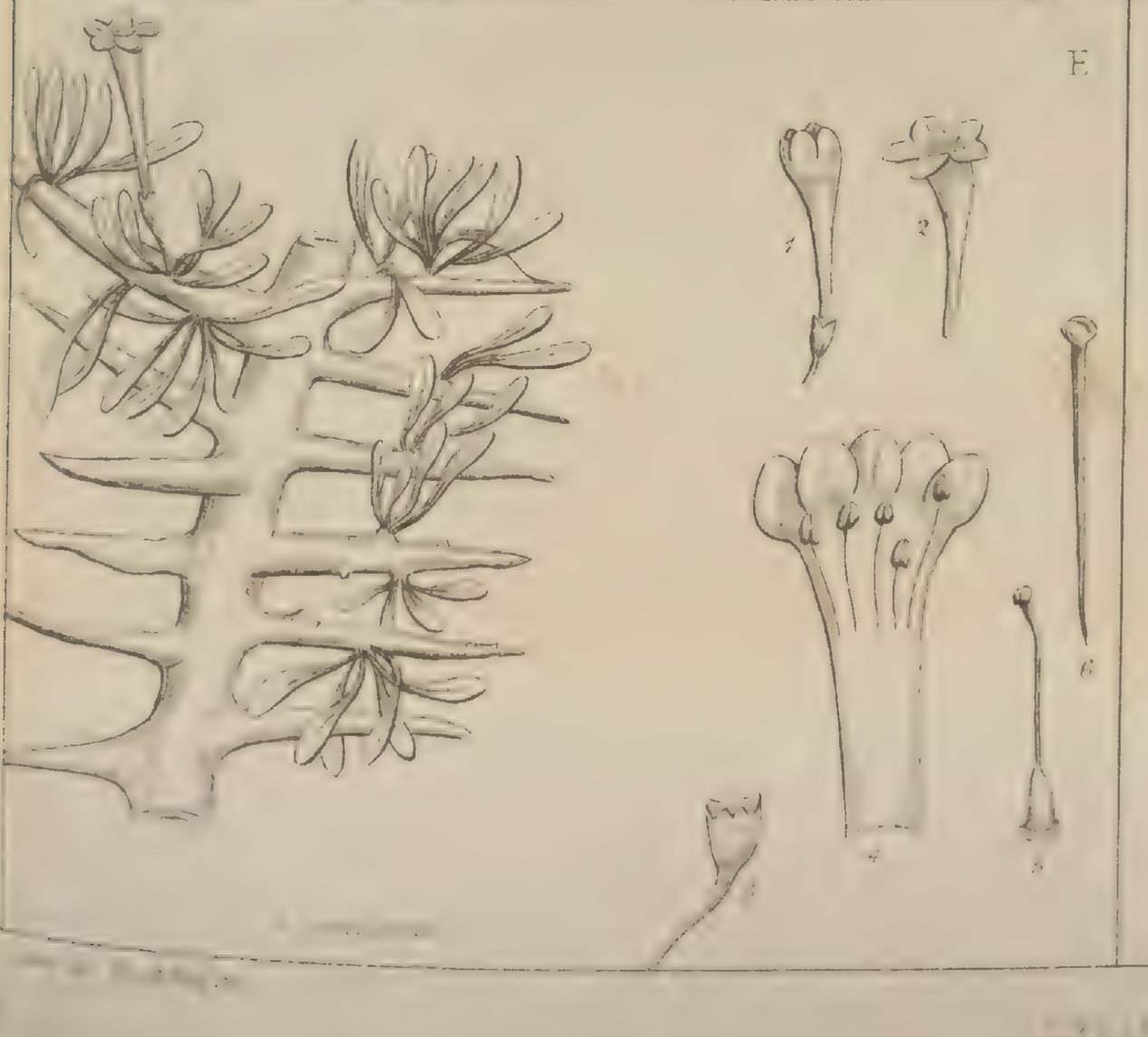
Ford & West Imp

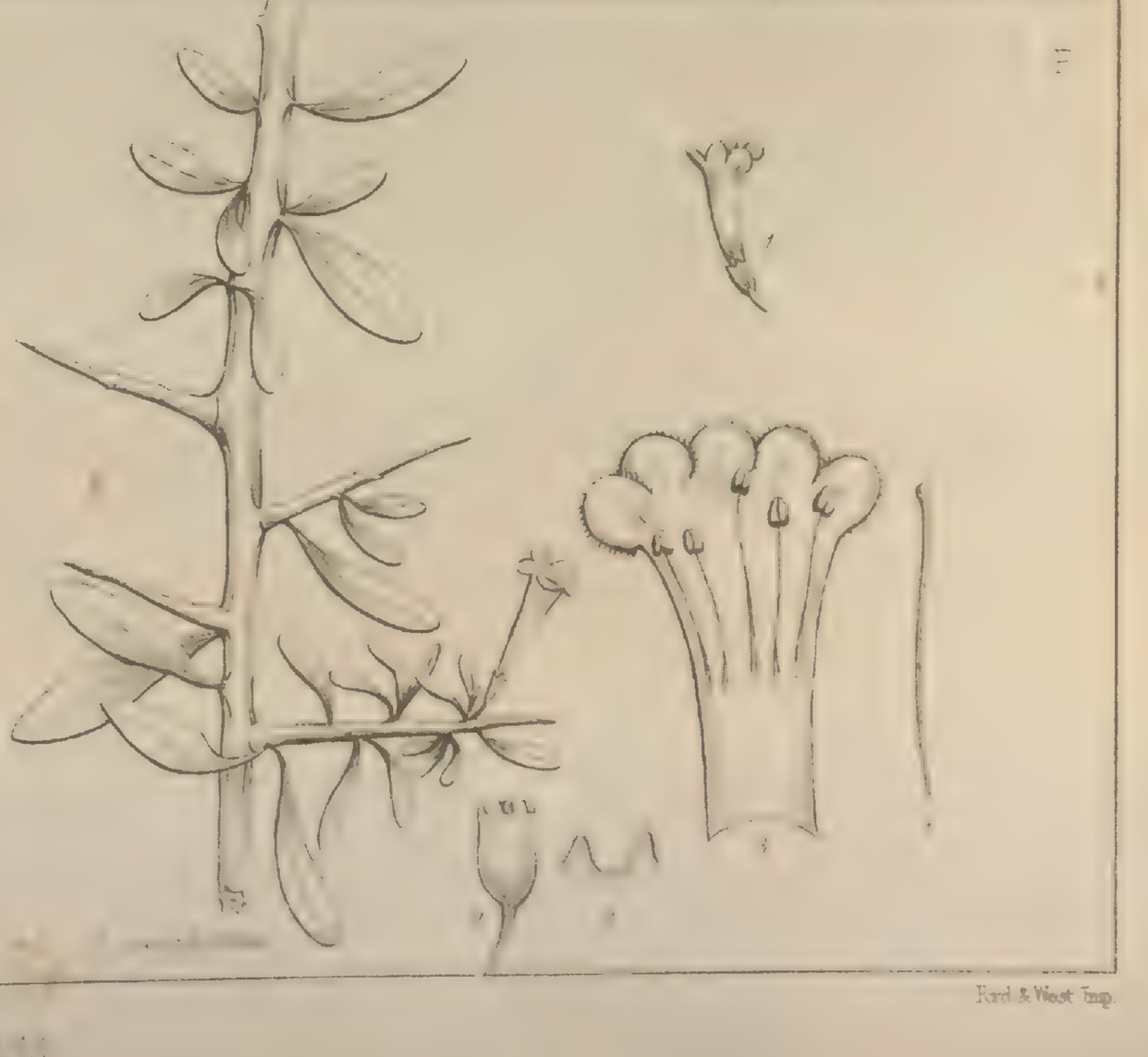
SCHWENKIA





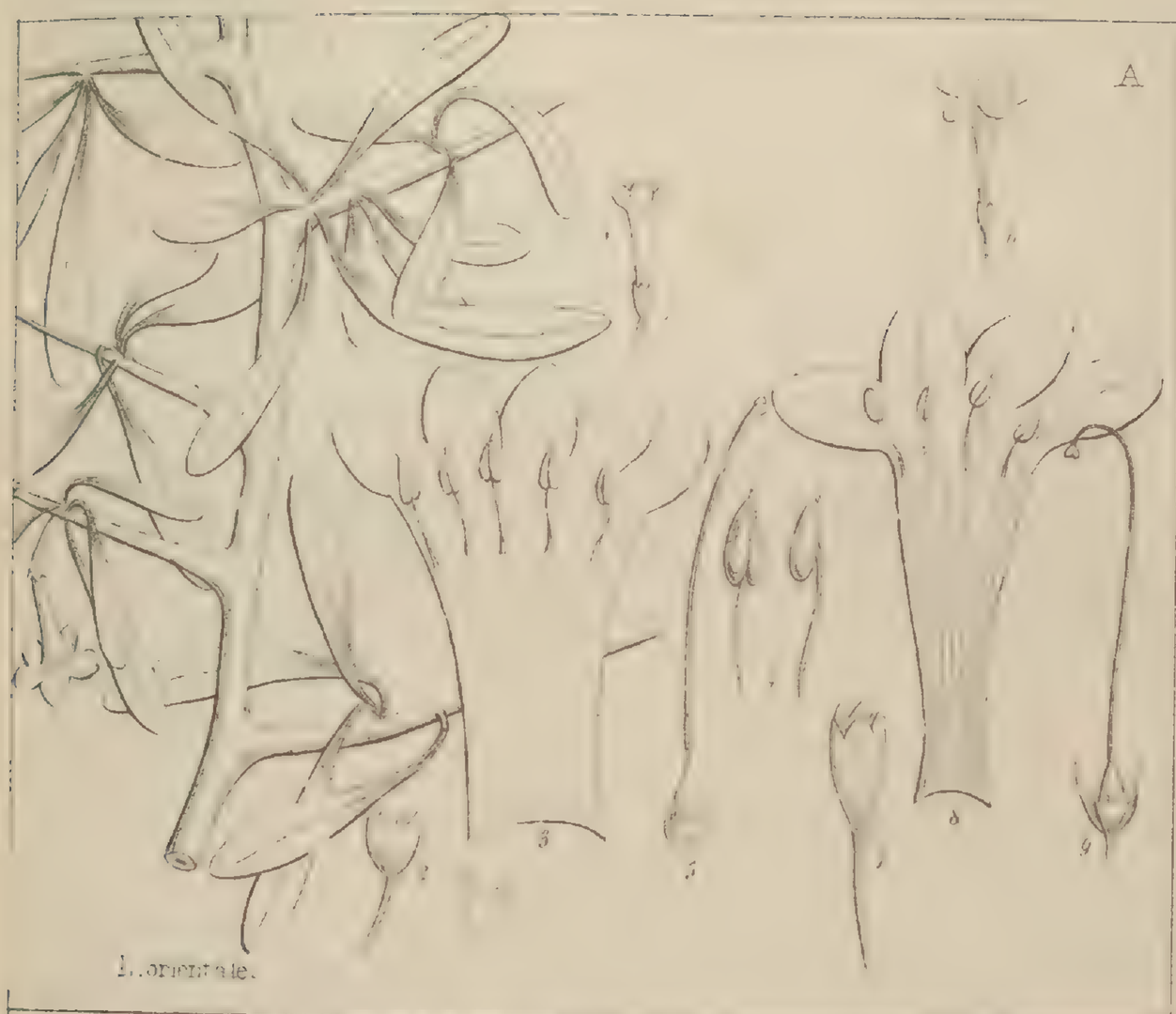






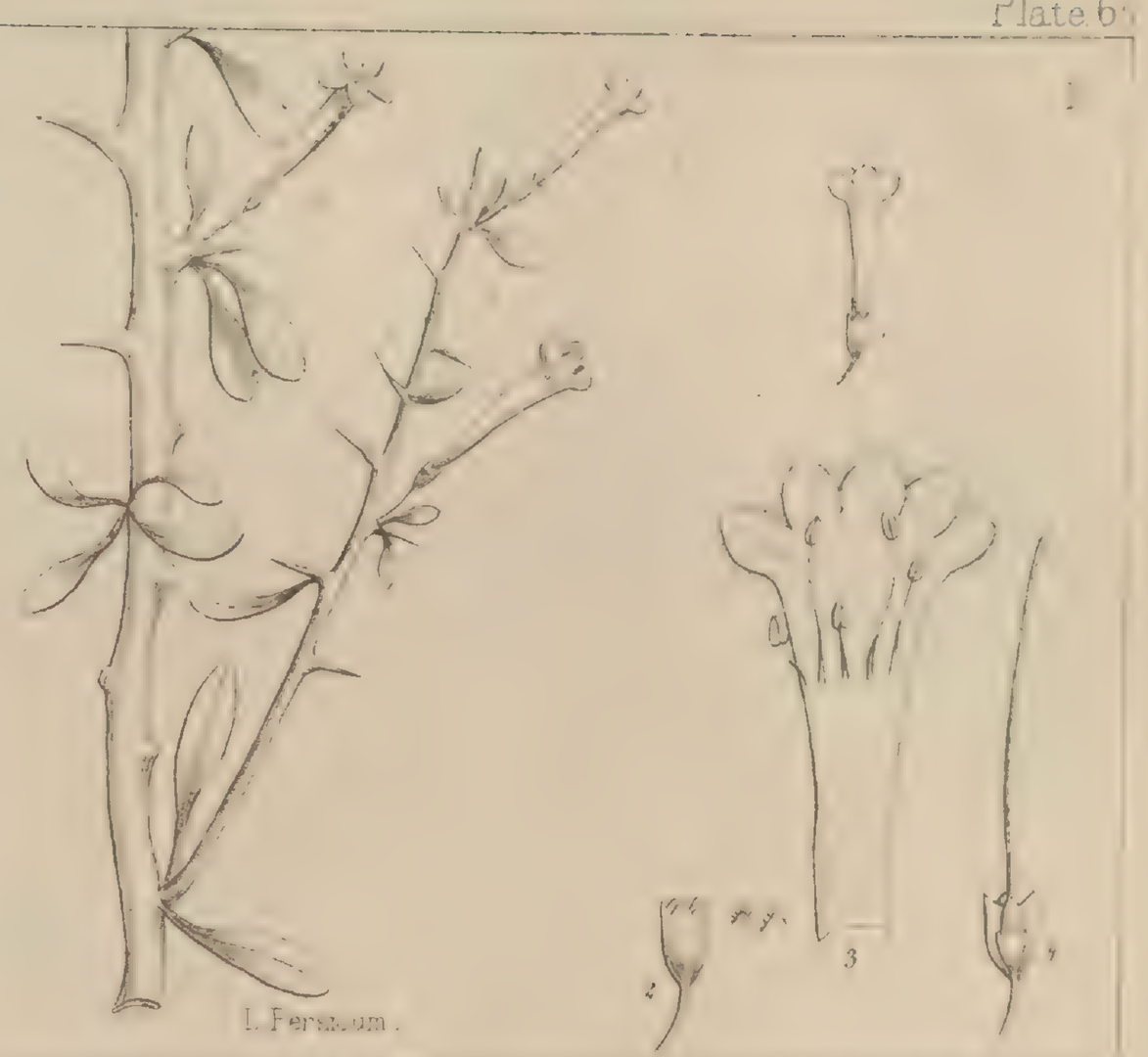
Ford & West Imp.

A



L. orientale.

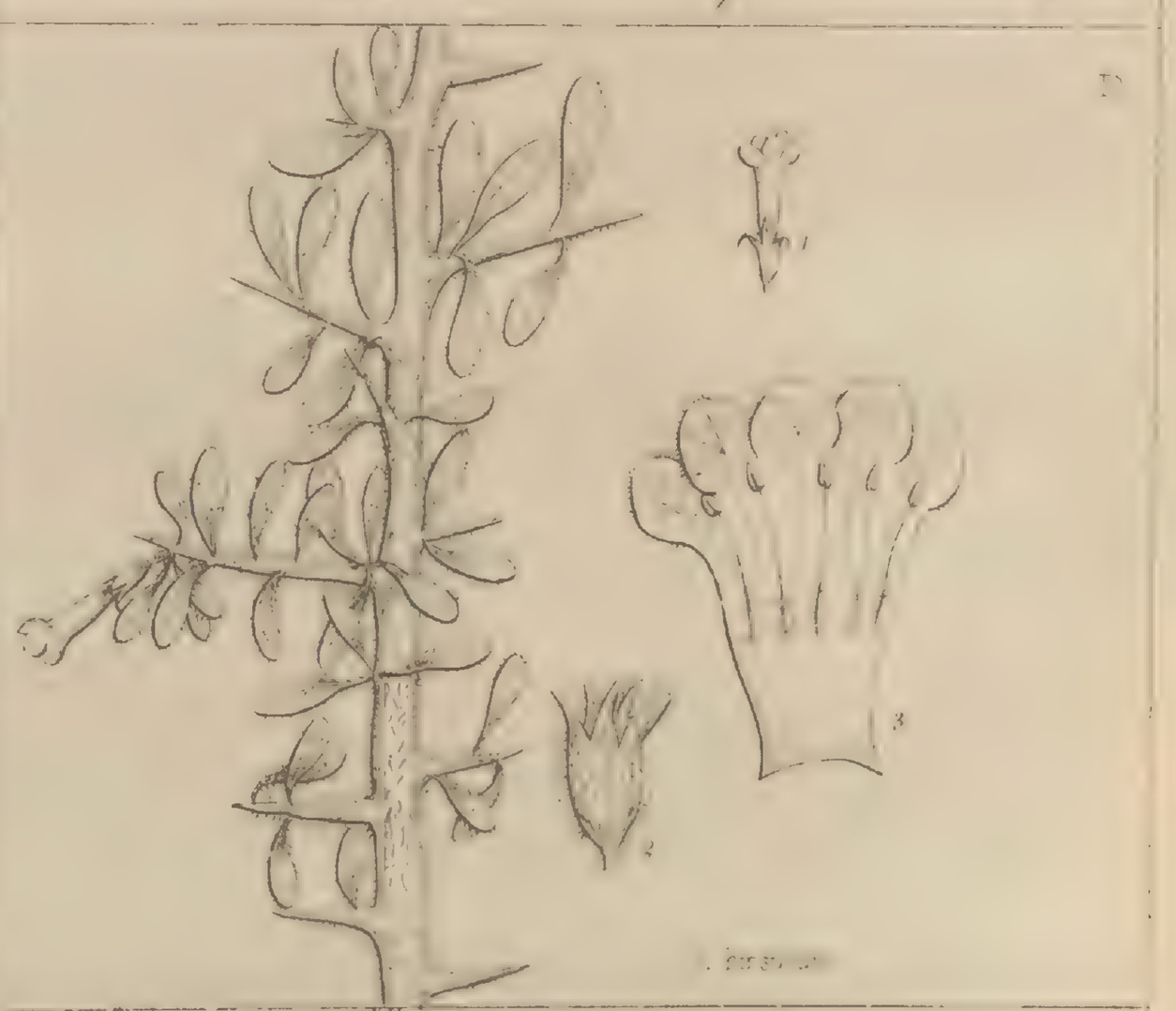
B



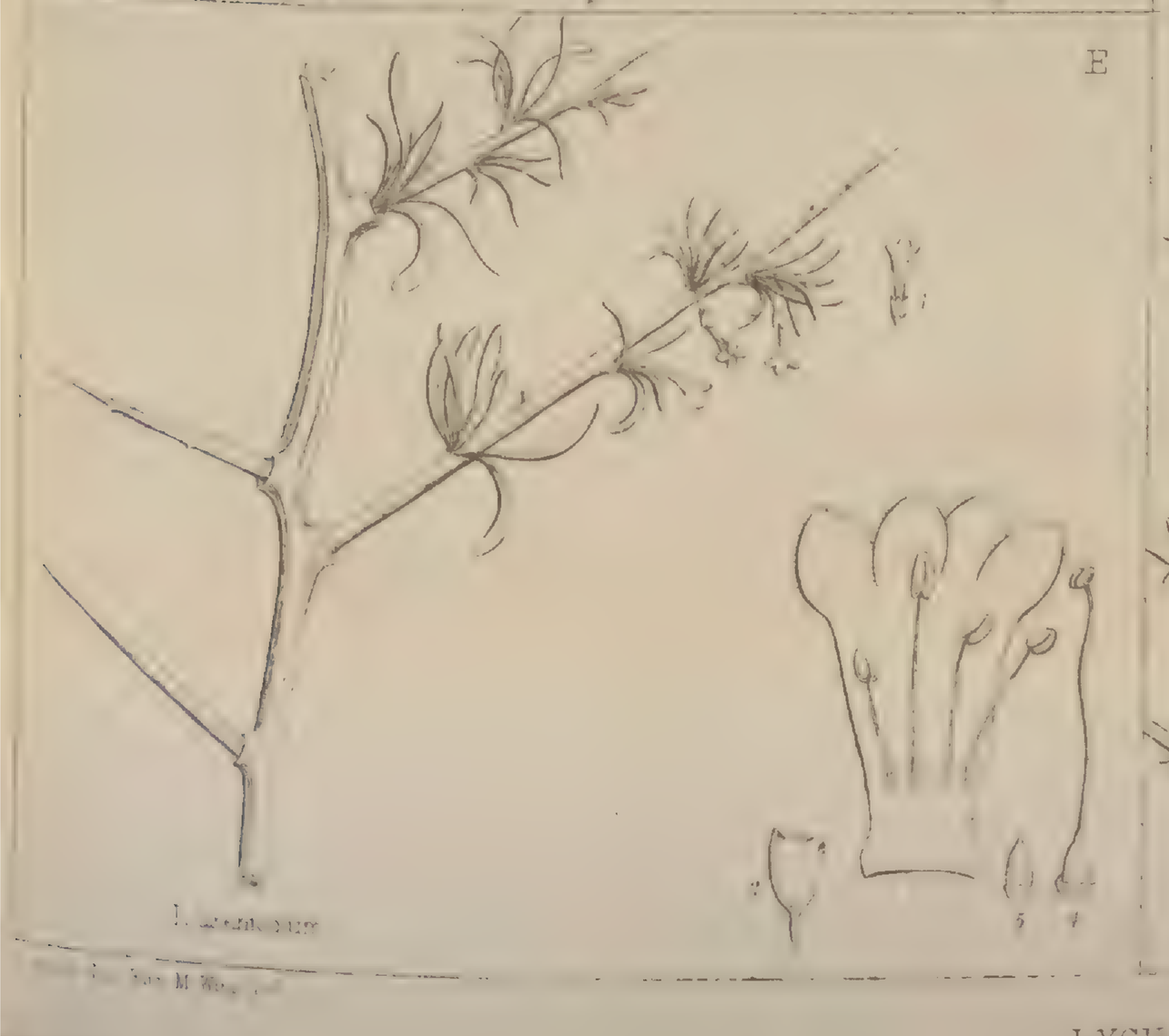
L. Fersianum.

C

D



E

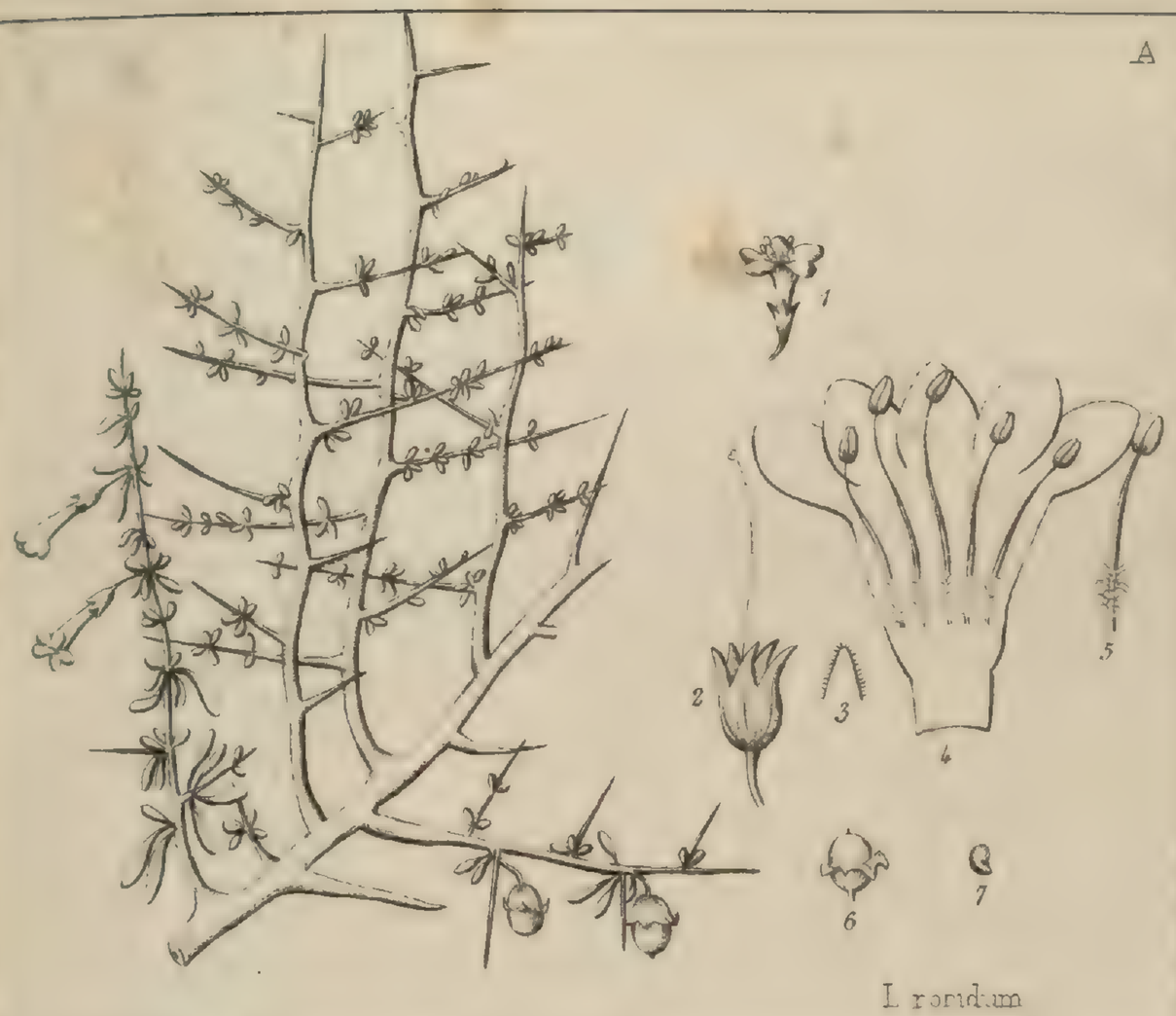


F

Ford & West Imp.

LYCIUM

A



L roridum

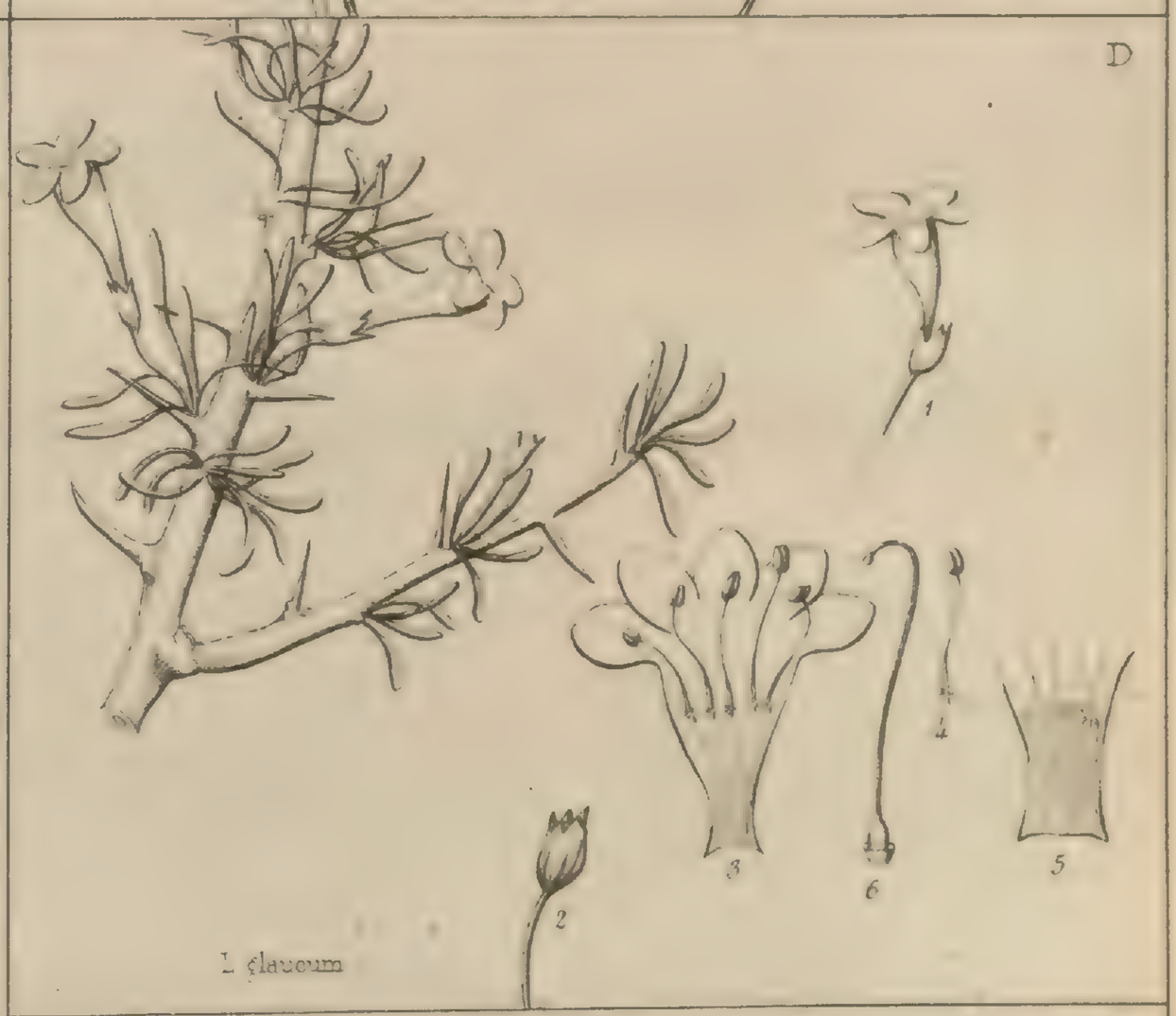
B

L ...urifolium

C

L ...trum

D



L glaucum

F

L echinatum

F

L tetrandrum

J Miers del Ibr M Wing lith

Ford & West Imp

LYCIUM.

A

L tenue

B

L

C

L pallidum

D

L fraxeum

E

L ruppleianum

F

L cestroide

Fordis West Imp

LYCIUM.

A

L. [illegible]

B

L. [illegible]

C

L. Confertum

D

L. [illegible]

E

L. Barbarum

L. glomeratum

A

L nodosum

B

C

L. brevipes

D

E

L. Turcomanicum

F

L. Edgworthii

J Mears del Eliz M Wing lith.

W. West. Imp

LYCIUM

A

L. Ruthenicum

B

C

L. Tataricum

D

L. Barbarum

E

L. Capillare.

L. Chinense

J. Miers del. Fitz. R. Mine Inc.

C

L. stoloidum.

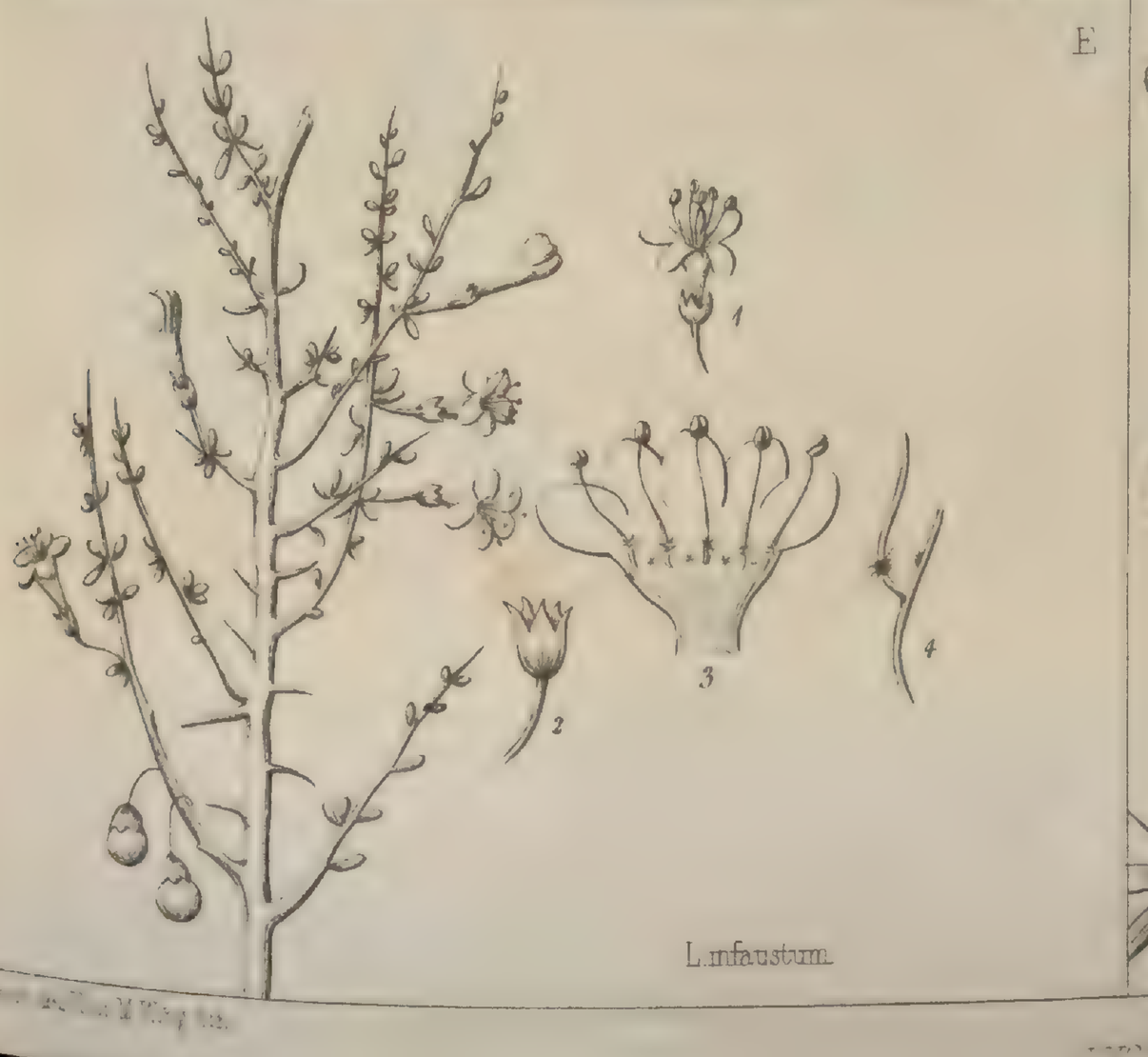
A

L. rachudocladum

B

L. tenuispinosum.

E



L. infaustum.

F

L. Cardinianum

Lowe del. et lith. W. West imp.

Tab. 71

A

L. cognatum.

B

L. tinctorium

C

L. salsum.

D

L. Chilense.

E

L. pubescens

F

L. Patagonicum

A

L. scoparium.

B

L. scoparium var. linearé

C

L. scoparium var. confertifolium.

D

L. scoparium var divaricatum

E

L. scoparium var. affine

F

L. Grevilleanum

A

L. erosum.

B

L. Gilliesianum

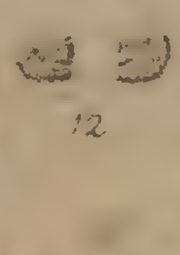
LYCIUM.

C

Coleophora gemmiflora.

J Miers del. Eliz.M.Wing lith.

W.West Imp



Millers del'

Engd. by [illegible]

J Miers lith

Printed by Hullmandel & Walton

Atropa acuminata

Withania. frutescens.

Withania aristata.

J.Miers del.

Anisodus luridus.

Hyoscyamus niclus.

J. Miers del.t

Mandragora officinarum.

Printed by Hullmandel & Walton.

Physochlœna rubricaulis.

Printed by Hullmandel & Walton

Scopolia Carniolica

J. Miers, lith.

Printed by Hullmandel & Walton.

Anthocercis viscosa.

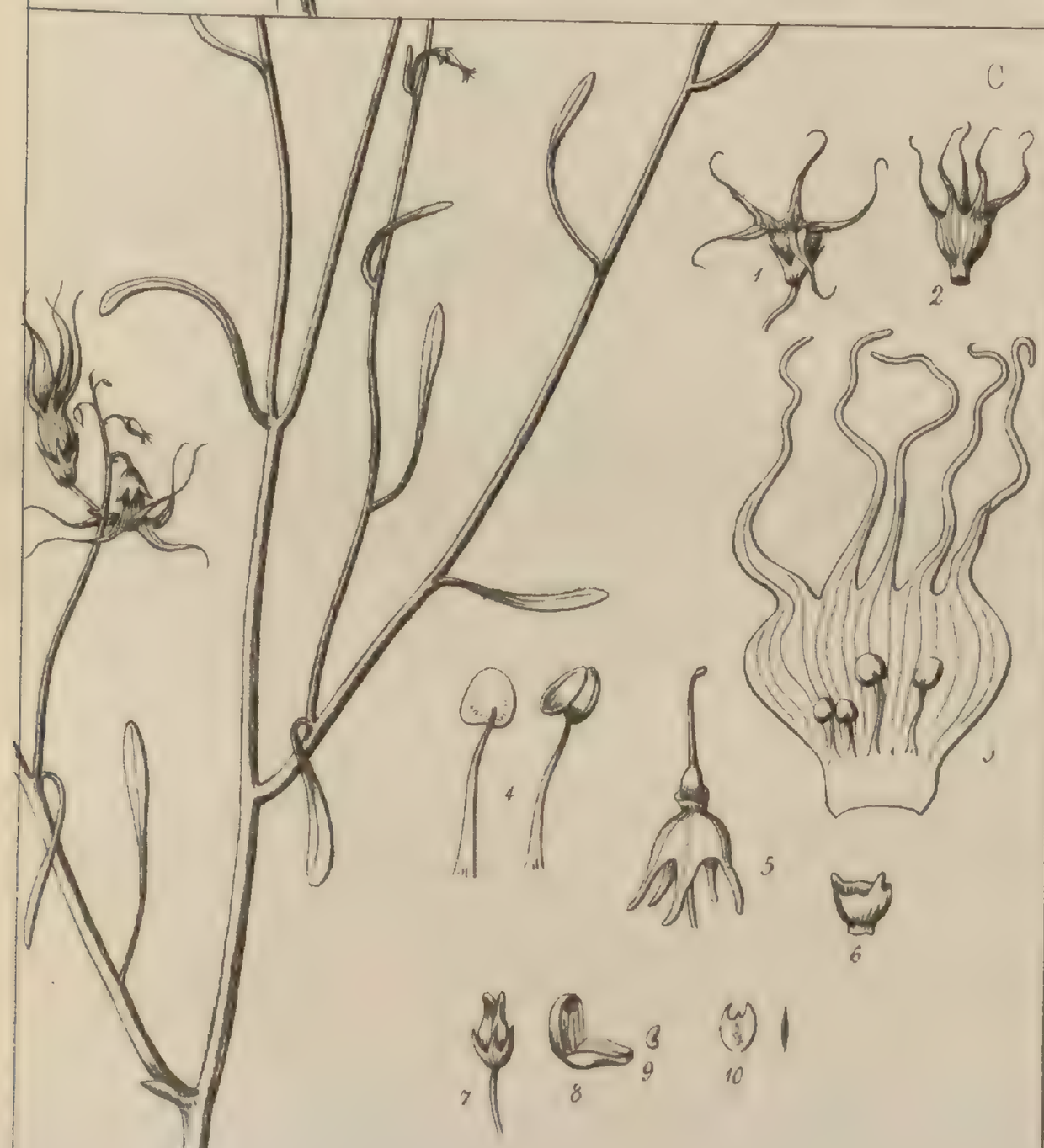
A

A littorea

B

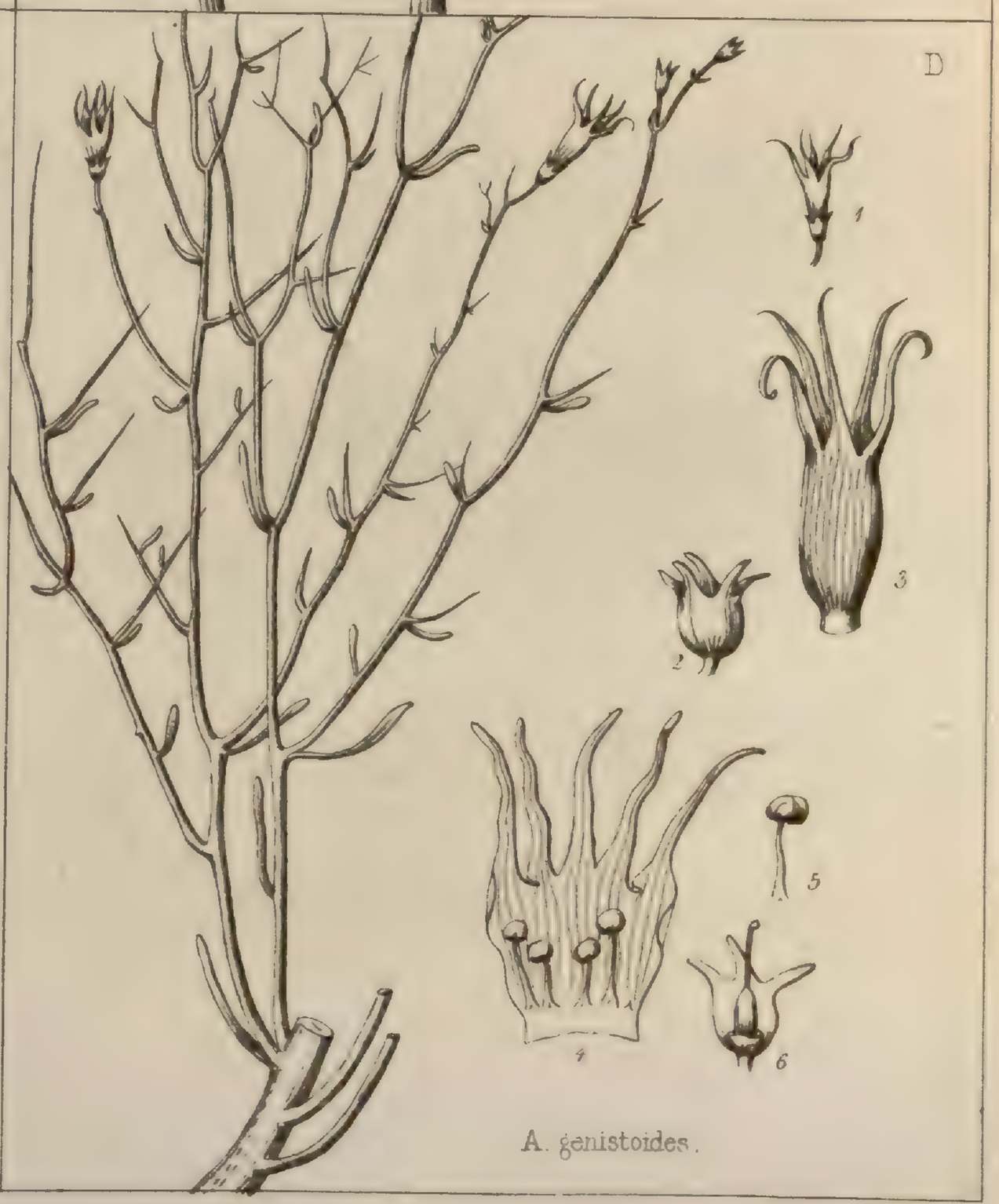
A ilicifolia

C



A gr[illegible]

D



A. genistoides.

J. Sowerby del. Ehz. M. Wing lith.

W West Imp

ANTHOCERCIS.

A

C. frondosa.

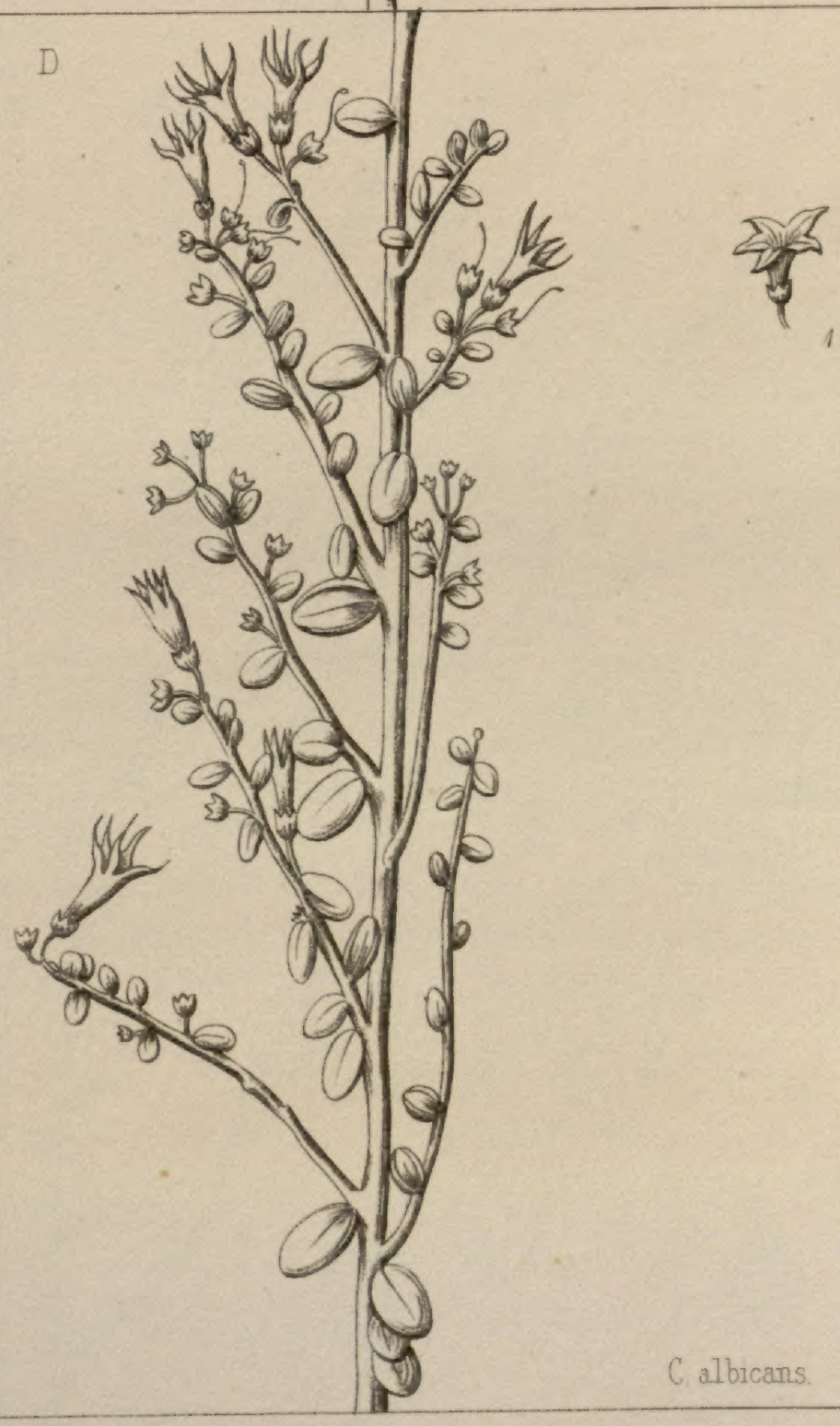
B

C. Tasmanica.

C

C. cuneata.

D



C. albicans.

J. Miers del. Eliz. M Wing lith.

W. West Imp

CYPHANTHERA

A

C. tomentosa.

B

1

2

3

4

5

C. scabrella.

C

1

2

3

4

5 6 7 8

9 10 11

C. ovalifolia.

D

1

2

3

4

5

6

7

8 9

10 11

C. microphylla.

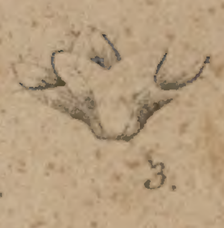
J. Miers del. Eliz. M. Wing lith.

W. West Imp.

CYPHANTHERA

1.

2.


3.

4.

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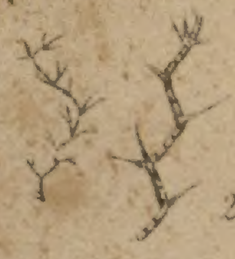
8.

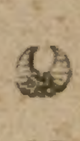
11. 10.

12.


21.

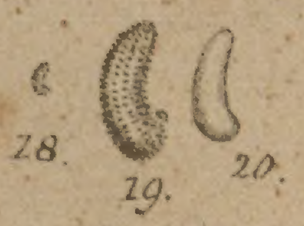
13.

14.


15.

16.

17.


18. 19. 20.

J.Miers. del.t

Anthotroche pannosa.

J. Miers, lith.

Printed by Hullmandel & Walton.

Duboisia myoporoides.